RAILROAD GAZETTE

FRIDAY, NOVEMBER 3.

Contributions.

Applying Air-Brakes in Emergencies.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Supposing the newspaper account of the unfortunate accident on the Pennsylvania Railroad was the correct one, and the attempt to reach the valve of the air brake in the coach failed because the aisle was blocked with passengers, it would not have been necessary for the engineer to rush back into the blazing cab at the risk of his life.

By simply reaching down and cutting the hose, or drawing the coupling (air brake) between the engine and the first car up, so that the hose could be uncoupled by hand, the brakes on the train would have applied themselves at once and brought the train to a standstill. H. B.

Testing Locomotive Boilers.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your issue of Oct. 6 an article headed "Testing Locomotive Boilers," copied from the *National Car-Builder*, as follows:

"A very effective and cheap method for testing locomotive boilers, either in the repairing of them, or in new work, has been invented by Mr. Robert Wiggins, General Foreman of the Cleveland, Columbus, Cincinnati & Indianapolis shops at Delaware, O. The method consists in completely filling the boiler with cold water when it is over the pit. * * * The whole arrangement is so inexpensive and so effective that it has been adopted at the other shops of the road."

Mr. Wiggins being represented as the *inventor* of the above method, I desire to state that Mr. Wiggins was formerly employed as a pit boss in the machine shops of the Lake Shore & Michigan Southern Railway, at Buffalo, N. Y., in which I was, and am still, shop foreman—and it was in these shops that he first saw or heard of the method he claims to be the inventor of.

In testing boilers at the shop the above idea occurred to me, and deeming it both simple and effective, I, with the permission of the Master Mechanic, tried it, and finding it to work satisfactorily, we adopted the method in testing all our boilers.

I do not claim to be the inventor of the idea, but I do claim that I had never saw or heard of the method before using it, and know for a fact that Mr. Wiggins knew nothing of it until he saw it used by me in these shops.

PETER FOLLER, Foreman Machine Shop.

BUFFALO, N. Y., Oct. 28, 1882.

The St. Paul Emigrant Traffic.

Western Trunk Lines Passenger Association.

CHICAGO, Oct. 27, 1882.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your editorial article in issue of Oct. 20, on "The Chicago and St. Paul Emigrant Travel," while in the main correct, so far as the past history of the matter is concerned, is, to some extent, erroneous in its conclusions.

The decision of the trunk lines simply leaves the question where it was before they undertook its consideration. It is quite evident from the report of their decision that they were loath to take part in the discussion of a question which they deemed should be settled by the Western lines themselves, and they consequently concluded to allow it to remain in *statu quo*, carefully refraining from committing themselves as to the merits or demerits of any of the disputing lines. The report referred to concludes as follows:

"In arriving at this conclusion, the Committee does not undertake to say what is a fair division of the passenger traffic, as between the three routes, upon general grounds; nor do they wish to have their conclusions considered in any way as of any bearing upon this question arising between the three competing roads themselves. The Committee is fully aware that entirely different considerations may enter into questions of this kind than those which influence the action of the trunk lines in regard to dividing controllable traffic between the three routes.

"Whenever the interested parties agree themselves upon any division of emigrant traffic, the Trunk Line Committee will be glad to make the distribution accordingly, provided they can do so with full justice to the emigrants."

We expected a decision less diplomatic in its terms, and more directly in our favor; but we submit that the above cannot fairly be construed as committing the Eastern trunk lines to the principle that time and distance are of no value in determining the relative advantages of rival routes, or, in other words, that a long and circuitous route is entitled to just as much business as a short and direct one.

W. H. DIXON, Commissioner.

[Our note, to which Mr. Dixon refers, was written under a misapprehension as to what had been actually decided. The extract from the report of the Trunk Line Committee in Mr. Dixon's letter (which we published last week) shows that it did *not* decide that the Albert Lea route is entitled to one-third of the emigrant traffic. We understand, however, that the other lines contending that this route was having more than its fair share, the Rock Island succeeded in convincing the Eastern lines that in respect to speed and other accommodations, the service had been perfectly satisfactory to the emigrants, and they did not feel called upon to change the course of business so long as that was the case.

It is the service actually performed and not the capacity for performing service which determines the distribution of traffic under competition. If the route from New York to Cincinnati *via* Montreal should carry passengers as quickly, safely and comfortably as the short routes, it would probably get as large a share of the travel as they, at equal rates, notwithstanding the fact that it is 75 per cent. longer, and that the short routes could, *if they would*, make the journey much shorter in time. To get the benefit of their advantages in distance, they have to use them. We know next to nothing of the time made by emigrants between Chicago and St. Paul by the several routes; but if the trains by the Albert Lea route make as good time as those by the other roads, it is because the latter do not do as well as they might. If they are made to run as fast as the Rock Island trains, they will make much shorter time to St. Paul, and unless emigrants are very different from the rest of us, they prefer (other accommodations being equal) the route by which they waste the least time on the road; and no artificial distribution of the traffic can be called a fair one which does not take this fact into consideration. In a pool, a road is not entitled to anything more then it can get out of one when it and its competitors *all do their best*; unless, indeed, it may be allowed more than its share of some traffic in consideration of giving up something else. At least that seems to us the equitable method of dividing traffic, or profits rather, among co-operating roads.—EDITOR RAILROAD GAZETTE.]

American vs. English Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In a communication which appeared in your columns a few weeks ago on the subject of "Wasting and Saving Fuel," I wrote: "On the London & Northwestern Railway in England, express engines making an average speed of 45 miles an hour, and pulling a train equal to six American coaches, burn from 25 to 30 pounds of coal per mile." By a typographical error this was made to read 23 to 20 pounds. I supposed your readers would be intelligent enough to perceive that a blunder had been made from the way the figures were put, and did not think it necessary to send you a correction. In this assumption I was, however, mistaken, as witness the letter of a correspondent in last week's issue.

Throughout the paper on wasting and saving fuel, I endeavored to show that the British fireman is trained under stricter methods than the American fireman is subjected to, and in doing so I described the primitive mode of preventing smoke by deflecting air with the shovel, merely as an illustration of how carefully they have got to attend to their work. It certainly required an elastic imagination on the part of Mr. Smith to construe that into an attack on American locomotives. There would be as much reason to say that a man was heaping obloquy and reproach upon President Arthur by asserting that Queen Victoria is a kindly old lady. I have had some experience in handling locomotives in this country and also in Britain, and I have met a great many locomotive engineers who have run engines on both sides of the Atlantic; but I never yet conversed with one of them who did not prefer the American engine. For convenience in handling, for freedom from the innumerable small defects that entail torture on the road with British engines, and for general durability there is no engine run on wheels that can compare with the American locomotive. But it does not follow because our locomotives lead the mechanical world that there is nothing in other countries worthy of imitation. Narrow place prejudice is sometimes as pernicious as national egotism. One man sees nothing but stupidity in methods different from what he has been accustomed to in his own little shop or railroad or state, and he lacks liberality to perceive that others may be ahead of himself. This is not the way the world has been kept going. Mr. Smith need not waste ink portraying the egotism, intolerance and general combativeness of John Bull. There are a good many John Bulls around who never crossed the Atlantic.

ANGUS SINCLAIR.

Consumption of Fuel in Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I was much surprised to read a few weeks ago of the very small coal consumption of English locomotives in Mr. Sinclair's report to you. But I was still more surprised by the (dreadfully prejudiced) letter of Mr. F. C. Smith in your issue of Oct. 20.

First, as to the facts and figures for comparison. In England every locomotive superintendent knows how much coal each of his engines is burning, but not always how much work each is doing; for the locomotive department seldom keeps a record of the number of carriages in a train. In America few railroad companies seem to keep accurate statistics of the coal burned per mile. Seeing, then, that the foundation facts are so incomplete, it is impossible to draw an exact comparison.

We may start, however, with Mr. Webb's statement that his coupled engines (17 × 24) burn at least 30 lbs. of coal per mile; and we know that the load on such trains varies between about 8 and 17 English six-wheeled coaches. On the other hand, we may take, for example, from your Locomotive Returns list for June, 1882, a heavy train average of 5.25 passenger cars, and find that the coal burned per mile is 62 lbs. Now, roughly speaking, this means as follows:

That the American engine with 5.25 cars burned twice as much coal as the English engine, each hauling about the same weight. This is on the supposition that an English six-wheel carriage weighs about half as much as an American car.

As an individual instance of economy, I have known an English engine with one pair of driving-wheels to work the "Irish mail" of five or six six-wheel carriages for a month on 23 lbs. of coal per mile; but that was largely due to the extreme care in firing.

From this, and from an immense mass of other indications (I do not like to call it evidence, because it is not exact enough), we cannot help concluding that American engines burn more coal per weight hauled.

And this brings me to a suggestion, that a far better means of comparison would be the coal burned per ton (or 10 or 20 tons) hauled, including weight of engine and tender. This would not be difficult to find, as each railroad company knows the weight of its own rolling stock. It would be a number which would indicate to a certainty the state of an engine or the treatment that it was receiving from its fireman; and would be an admirable and easy basis of comparison for engines all over the world. The best hope of such a system being adopted is the value of such information to each master mechanic.

I cannot close without indicating what appear to me the three main points which make the consumption of an English engine lower than that of an American, each of which is independent of the skill of American mechanics, of which Mr. Smith is so boastful, and to which I, too, can bear a little testimony, though I well know that a great many of the best American mechanics learned their trade in England. And these are:

1. The loss by friction on curves in America is greater.
2. The grades in America are more frequent.
3. The entire heating surface of English engines is of copper or brass, which has a conductivity for heat of say 100; while the entire heating surface of an American engine (though the fire-boxes are slightly thinner) is of iron or steel, whose conductivity in comparison is only 15.8.

EDGAR WORTHINGTON.

Association of American Railroad Superintendents.

We give below the official report of the fourth meeting of this association, which began in New York Oct. 18, and continued on the following day:

At the opening of the session on Wednesday, Oct. 18, there were present:

E. T. D. Myers,	Albert Allen,
Waterman Stone,	W. M. S. Dunn,
J. F. Divine,	J. H. Thompson,
D. W. Sanborn,	Peyton Randolph,
John C. Winder,	V. E. McBee,
P. S. O'Rourke,	R. M. Sully,
R. G. Fleming,	J. R. Kenly,
I. D. Barton,	J. M. Metheany,
J. L. Mapes,	E. G. Allen,
C. S. Gadsden,	D. W. C. Rowland,
R. Schermerhorn,	Wm. H. Stevenson.
Geo. V. Morford.	

The meeting was called to order by P. S. O'Rourke, Third Vice-President.

After the reading of the records, the following active members were elected:

Cecil Gabbett, General Manager Western, of Alabama.

R. A. Anderson, Superintendent Western & Atlantic.

J. H. French, Assistant Superintendent Old Colony Railroad.

S. L. Werden, General Manager Houston Belt Railroad.

E. G. Allen, Superintendent Massachusetts Central.

R. Schermerhorn, Engineer and Superintendent Prospect Park & Coney Island.

Thos. Groome, Superintendent Junction & Breakwater.

Geo. V. Morford, Superintendent Nebraska Division Chicago, St. Paul, Minneapolis & Omaha.

D. W. C. Rowland, General Superintendent Transportation, Louisville & Nashville.

J. R. Kenly, Superintendent Richmond & Petersburg.

E. T. Smith, Superintendent Eastern Division Chesapeake & Ohio.

V. E. McBee, Superintendent Western North Carolina.

Honorary members were elected as follows:

H. S. Haines, General Manager Savannah, Florida & Western.

Chas. F. Hatch, General Superintendent Chicago, St. Paul, Minneapolis & Omaha.

E. W. Winter, Assistant President Chicago, St. Paul, Minneapolis & Omaha.

W. O. Hughart, President Grand Rapids & Indiana.

Geo. C. Kimball, General Manager Chicago & West Michigan.

P. J. Nichols, Division Superintendent Union Pacific.

E. C. Brown, Assistant General Superintendent Michigan Central.

G. W. Holdrege, General Superintendent Burlington & Missouri River.

C. S. Turner, President & General Manager Worcester & Nashua.

R. L. Walker.

Henry Fink, Second Vice-President and General Manager Norfolk & Western.

Jerome A. Fillmore, General Superintendent Central Pacific.

The Treasurer presented his report, which was accepted and ordered placed on record.

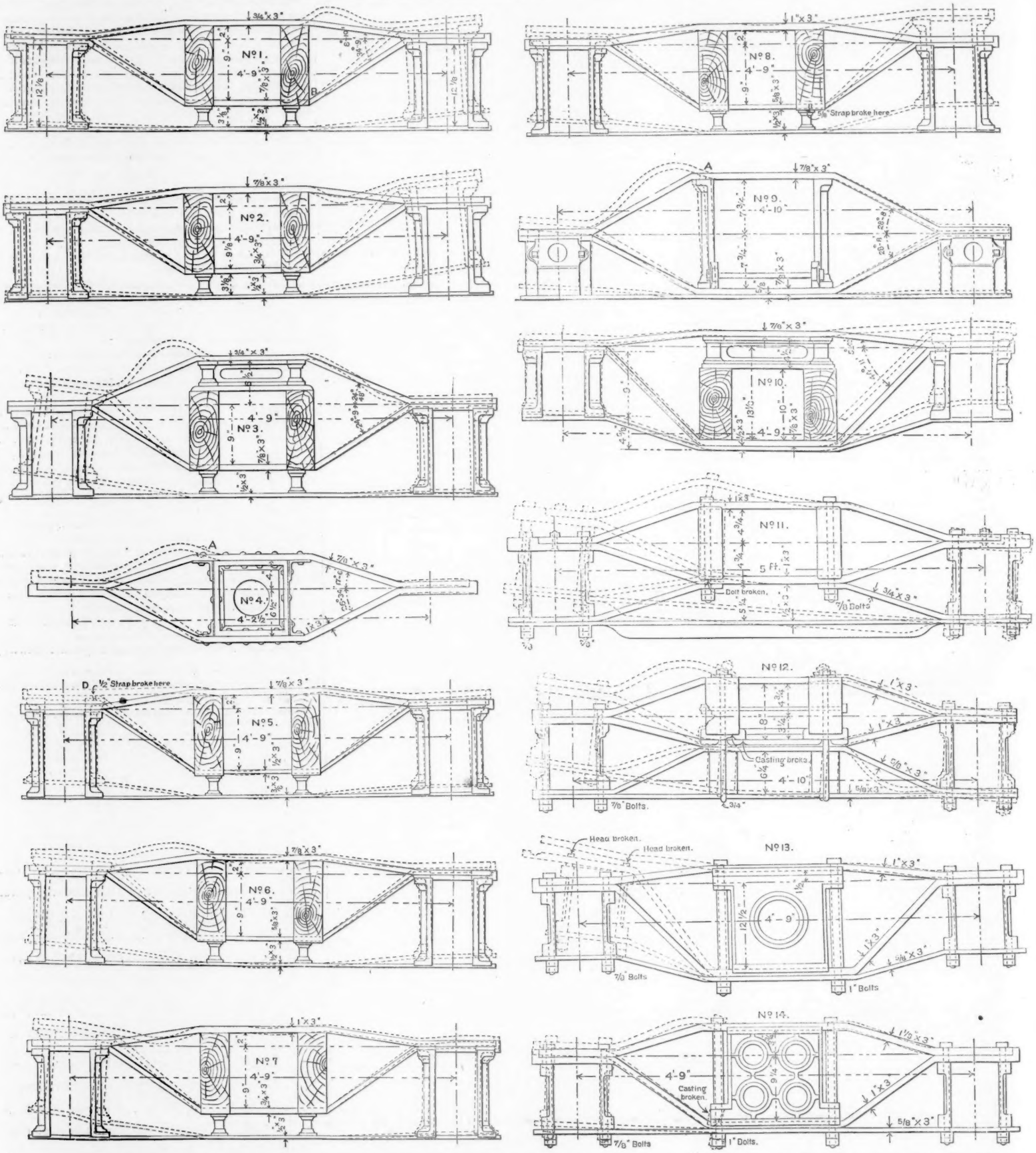
The following named gentlemen were elected officers for the ensuing year:

President, P. S. O'Rourke; First Vice-President, E. T. D. Myers; Second Vice-President, R. Schermerhorn; Third Vice-President, A. A. Folsom; Secretary, Waterman Stone; Assistant Secretary, D. W. Sanborn; Treasurer, R. M. Sully.

TRAIN SIGNALS.

Major Meyers, from the Committee on Train Rules and Signals, made verbal report, recommending the signal code discussed at the last meeting.

The following signals were then adopted and recommended to the members for adoption:



Enginemen's Signal by Whistle.

1. *One* short blast of the whistle is a signal to apply the brakes—stop.
2. *Two* long blasts of the whistle is a signal to throw off the brakes.
3. *Two* short blasts of the whistle, when running, is an answer to signal of conductor to stop at next station.
4. *Three* blasts of the whistle, when standing, is a signal that the engine or train will back.
5. *Three* short blasts of the whistle, while running, is a signal to be given by passing trains when carrying signals for a following train, to call attention to the signals, and *four* short blasts is the answer to it.
6. *Four* long blasts of the whistle is a signal to call in the flagman or signalman.
7. *Six* short blasts of the whistle is the engineman's call for signals.
8. *Two* long, followed by two short blasts of the whistle, when running, is a signal for approaching a road-crossing at grade.
9. *One* long blast of the whistle is a signal for approaching stations, railroad-crossings and junctions.
10. A succession of short blasts of the whistle is an alarm for cattle, and may be used to call the attention of trainmen to danger.
11. A blast of the whistle of five seconds' duration will be considered as a long blast.

Conductor's Signals by Bell-Cord.

1. *One* tap of the gong, when the engine is standing, is a notice to start.
2. *Two* taps of the gong, when the engine is standing, is a notice to call in the flagman.
3. *Two* taps of the gong, when the engine is running, is a notice to stop at *once*.
4. *Three* taps of the gong, when the engine is standing, is a notice to back the train.
5. *Three* taps of the gong, when the engine is running, is a notice to stop at the next station.

One tap of the gong, when running, will be regarded as a warning that the train has parted, and the engineman will follow the rule prescribed for that emergency.

Lamp, Hat, or Hand Signals.

6. Swung across the track is a signal to stop.
7. Raised and lowered vertically is a signal to move ahead.
8. Swung in a circle is a signal to move back.

OTHER REPORTS.

The report of the Committee on Car Exchange was referred to the next meeting.

Mr. Metheany, from the Committee on Injuries to Employés, made verbal report, and asked for further time, which was granted.

A communication from the Yard-Masters' Mutual Benefit Association was read and ordered placed on file.

The first by-law was amended to read as follows:

"Meetings of the Association shall be held on the Mondays following the third Wednesday in April and October, at 10 o'clock, a. m."

It was then resolved that the next meeting of the Association be held at the Grand Pacific Hotel, Chicago, and that the eleventh by-law be suspended for the ensuing year.

The following preamble and resolution was adopted:

"*Whereas*, For the better protection of the traveling public and railroad employés, it is the sense of this meeting that great care should be exercised in the selection of men for responsible positions; therefore be it

"*Resolved*, That this association recommend its members not to employ discharged employés of other railroads, unless they present a letter from the superintendent of the road from which they were discharged, stating the cause of such discharge."

It was then:

"*Resolved*, That the proceedings of this meeting be printed, and a copy sent to each member of the Association.

"*Resolved*, That the future meetings of this Association be held with closed doors, unless otherwise ordered by vote of the Association.

"*Resolved*, That the question of free passes be referred to a committee of three, to report at the next meeting."

Messrs. J. C. Winder, J. R. Kendrick, and J. M. Metheany were appointed as that committee.

It was then:

"*Resolved*, That the Secretary be instructed to prepare a certificate of membership for members of the Association, and that no such certificate be issued to any member unless all arrearages in the assessments are paid.

"*Resolved*, That a subject for discussion shall be the proper number and disposition of train crews on passenger and freight trains, their signals and appliances, and that a committee of three be appointed to report upon this subject at the ensuing meeting."

TABLE SHOWING STATE OF TRUCK SIDE AT EACH 5 TONS PRESSURE UP TO POINT OF GIVING OUT.

Truck.	Pressure in Tons. 5	10	15	20	23	25	26	30	34	35	37	40	45	46	Remarks.
	Deflection in Inches.														
No. 1	..	1/4	....	3/8	.....	1/2	.....	5/8	Buckled	.....	.....	.....	....	.....	At 30 tons began to spring at *A*. At 34 tons top bar buckled and took form shown, pressure fell off 5 or 6 tons.
" 2	..	3/16	3/16	1/4	.....	3/4	.....	7/8	. .....	1	Buckled	.....	....	.....	At 37 tons top bar buckled as shown, pressure fell off.
" 3	1/16	3/16	1/4	1/2	Buckled	....	.....	.....	.....	.....	.....	.....	....	.....	At 23 tons top bar buckled as shown, fell back to 20 tons.
" 4	1/16	1/4	5/8	Buckled	.....	....	.....	.....	.....	.....	.....	.....	....	.....	At 15 tons began to spring at *A*. At 20 tons buckled as shown, rivet-head at *A* started
" 5	..	1/4	5/16	5/8	.....	1	.....	Broke 1 1/4	.....	.....	.....	.....	....	.....	At 28 tons middle bar cut into timber at *B*. At 30 tons middle bar broke through bolt hole.
" 6	..	1/4	3/16	1/4	.....	1/2	.....	1 1/8	.....	Buckled	.....	.....	....	.....	At 35 tons top bar crippled as shown.
" 7	..	1/8	1/4	5/16	.....	1/2	.....	3/4	.....	1 1/8	.....	Buckled	....	.....	At 35 tons commenced to give out. At 40 tons buckled as shown and broke edge of casting.
" 8	1/16	1/8	1/4	7/16	.....	5/8	.....	1	.....	1 3/8	.....	Broke 2	....	.....	At 35 tons commenced to spring. At 40 tons broke middle bar through bolt-hole.
" 9	..	1/8	1/4	3/16	.....	1/2	Buckled	.....	.....	.....	.....	.....	....	.....	At 25 tons commenced to spring. At 26 tons crippled, bolt head pulled off, could get no more pressure.
" 10	1/16	1/8	1/4	3/8	.....	1/2	.....	5/8	.....	.....	.....	3/4	1 1/2	Broke	At 25 tons cut into wood. At 46 tons broke middle bar at edge of wood.

Major E. T. D. Myers, and Messrs. W. M. S. Dunn and J. R. Kenly were appointed as that committee.

The meeting was closed by the adoption of the following:

"*Resolved*, That the thanks of the Association be, and they hereby are, extended to the National Railway Publishing Company, for the courtesies and accomodations extended to the Association.

"*Resolved*, That 500 additional copies of the Constitution, By-Laws, and list of members, be printed and distributed.

"*Resolved*, That this Association adjourn, to meet at Chicago on the Monday following the third Wednesday in April, at 10 o'clock a. m."

Master Car-Builders' Association.—Report of Committee on Standard Freight and Passenger Car Trucks.

To the Master Car-Builders' Association:

The Committee appointed to report on Standard Freight and Passenger Car Trucks have been somewhat at a loss to know just what is expected of them.

After the adoption of a standard wheel, journal box, journal bearing, axle, journal bearing key, it seems somewhat problematical whether any further progress in this direction is possible. The different forms of trucks used are as numerous as the mechanics who conceived them, many of them being excellent and all of them undoubtedly having some faults. Sometimes the weaker material is placed where the stronger should be, and therefore your committee, rather than submit any special form for adoption, have thought best to present a few tests for your consideration.

The tests presented were made in an ordinary wheel press. Only one side of each truck was tested by placing it under pressure so as to take the strain exactly as it does under a loaded car.

Most of these tested were made as far back as 1875, and the forms were the ones in common use on the Chicago, Burlington & Quincy road at that time. The more recent tests (which are designated as 11, 12, 13 and 14) were made at the Michigan Central shops last month.

Up to this time the very common mistake of placing the lightest iron in the upper arch-bar forming the frame of truck was in practice, but some discussion arising as to the correctness of this practice, led to the tests presented which proved the fallacy of this construction.

EXPERIMENTS RELATING TO STRENGTH OF CAR TRUCKS AND PROPER DISTRIBUTION OF MATERIAL.

The drawings herewith show in full lines the form of truck side before it was put under the press.

The sizes of parts are marked upon the drawing, as are the lengths, and distances, which are needed. The dotted lines show the form of the truck side when taken from the press.

The table A shows the amount that the centres of the truck sides fell below the original places for each 5 tons of pressure put on.

A part of this deflection of course was due to the coming together of the joints, which were forged work finished with the hammer and were not an exact fit—and a part from the cutting into the wood of the middle strap.

No. 1 is the freight truck now being built by the Chicago, Burlington & Quincy Railroad.

The top bar is weakest. It was the part that gave out. This stood a pressure of 34 tons (68,000 lbs.) though at 30 tons it began to show signs of weakness. The top bar was 3 in. × 3/4 in. The second bar was 3 in. × 7/8 in. The form taken is shown in dotted lines.

No. 2 is formed exactly like No. 1, except that the top bar is 3 in. × 7/8 in., and the middle bar 3 in × 3/4 in., their places being transposed.

The top bar buckled in this too, but at a higher pressure—37 tons instead of 34, as in case of No. 1.

The compressive strain on top bar of No. 1 *per square inch*, was 18,576.4 lbs.; the tensile strain of the second bar *per square inch*, was 19,044.7 lbs. The compressive strain on the top bar of No. 2 per square inch was 17,327.8 lbs. The tensile strain of the second bar per square inch was 24,179.3 lbs.

No. 3. This is the "Allen Truck" exactly as it has been built by the Chicago, Burlington & Quincy Railroad for some time, and until the top casting was left off and the truck formed like No. 1 was taken as a standard.

This only stood a test of 23 tons, when the top bar buckled with a compressive strain on the first bar per square inch of 9,872.6 lbs.; tensile strain on second bar per square inch, 9,285.8 lbs.

No 4 is an "Iron Truck" riveted together as shown and built by the Chicago, Burlington & Quincy Railroad, known as the "Chalender Truck."

This, like 1 and 3, has the lightest bar at the top, where it should not be. From the smaller depth of the truss the smaller strength might have been expected.

This stood but 20 tons, when it gave out. Compressive strain on top bar per square inch, 9,858.6 lbs.; tensile strain on lower bar per square inch, 9,234.8 lbs.

A rivet head was thrown off at *A* just as it gave out.

No. 5. This truck was built for the test with a light middle bar, it being but 1/2 in. × 3 in., while the top bar was 3 in. × 7/8 in., like that of No. 2. The truss otherwise was the same.

At 30 tons the 1/2 in. strap broke through the bolt hole at *D*. This hole was a drilled hole for an inch bolt, so that the area was 2 in. × 1/2 in. = 1 in. at the point broken. The second strap in this case as in others cut into the bottom of the truck timbers. The compressive strain on the first bar per square inch was 14,409.9 lbs. The tensile strain in the second bar per square inch was 29,407 lbs. The tensile area broken, 44,111 lbs.

No. 6 was another truck side built for the test with 5/8 in. middle bar. This stood 35 tons, and the top bar buckled, as in other cases. The compressive strain on the top bar, per square inch, was 16,398.8 lbs. The tensile strain on the second bar, per square inch, was 24,446.9 lbs.

No. 7 was built for the purpose of the test. The top bar was 3 in. × 1 in., and the second bar 3 in. × 3/4 in. With a load of 40 tons the top bar buckled and gave out. It began to show signs of weakness at 35 tons. The edge of pedestal block casting broke off just before it gave out. The compressive strain on the first bar per square inch was 16,391.2 lbs. The tensile strain on the second bar, per square inch, was 26,139.8 lbs.

No. 8 was built for the test with 5/8 in. middle bar and 1 in. top bar. At 40 tons the second bar broke through bolt hole as indicated in the engraving. No signs of failure in top bar.

The compressive strain on the top bar per square inch was 16,391.2 lbs. The tensile strain on the second bar per square inch was 31,368.1 lbs. As in case No. 5, the area broken was but 2 in. × 5/8 in. The hole being for an inch bolt, the pressure per square inch was broken, 47,051 lbs. In all these cases the size of the bottom strap has nothing to do with the strength of the truck. In some cases it has been 3 in. × 1/2 in., and in others 3 in. × 5/8 in. The latter would seem to be just as good as the other.

No. 9 is the truck in common use, and known as the "Cleveland Truck." it gave way under a pressure of 26 tons, and pulled off a bolt head at *A*. The compressive strain on the top bar per square inch was 10,503 lbs. The tensile strain on the second bar per square inch was 10,503 lbs.

No. 10 is a low truck built for low flat cars by the Chicago, Burlington & Quincy Company. It stood the pressure up to 46 tons, when the middle bar broke across its full area, as indicated in the engraving. It had cut into the wood when the pressure was 25 tons. The top bar kept its place. The compressive strain on the top bar per square inch was 16,810 lbs. The tensile strain on the second bar per square inch was 22,759.6 lbs.

No. 11. This is the New York Central standard, and would be much stronger if the auxiliary arch bar was not so constructed as to shear the bolt upon which the principal strain comes. This truss stood a pressure of 43 tons, when this bolt was sheared off, as indicated, and as a natural consequence the strength of the truss was gone.

No. 12. This truss was put together by Mr. James McGregor, Superintendent of the Michigan Car Company, for the test, and is the standard truck of the Grand Trunk road. It stood a pressure of 45 tons. It might be said to be similar in construction to No. 11, the difference being the auxiliary arch bar extends along under the inverted arch bar of the upper truss, consequently doing away with the shearing strain on the bolt, which broke in No. 11. This truck (No. 12) would be stronger if the places of this bar and the inverted bar in upper truss were exchanged.

No. 13. This truss is built by the Michigan Central for use under low platform cars used in road trains, and for log trains in the pineries. It is similar in construction to No. 10, the sizes of iron being heavier and consequently stronger in proportion. It stood a pressure of "60 *tons*," when the hook on lower arch bar broke and the bolts were sheared off. If the construction had been like No. 11, so as to prevent shearing at the ends of arch bars, it would have stood a greater pressure. Also the upper arch bar should have been 1 1/4 in. thick to have been proportionately strong with the other material.

No. 14 was the standard of the Michigan Central before the adoption of No. 11 by the Vanderbilt lines. It also stood a pressure of 60 *tons*, but the upper arch bar was 1 1/8 in. thickness instead of 1 in, as was the case in No. 13, which makes the strength of material nearer right proportionally. To make the distribution of the material nearer right, the upper arch bar should be 1 1/4 in. thick, and the inverted bar 7/8 thick. There are many other forms that are not presented, but this is as much as your Committee could present in the limited time it had for preparation, and, indeed, most of the material forming these suggestions had been collected, beginning as long ago as 1875.

Your Committee have thought best to rest this report on these suggestions without submitting any stated forms, awaiting further action for instructions from the convention.

El Paso to Chihuahua.

A correspondent of the New York *Tribune* writing from El Paso Sept. 9 gives the following account of the country on the line of the Mexican Central north of Chihuahua, and the dangers from Indians encountered by the engineers in surveying the road:

In this Mexican El Paso at present the progress of the railroad is the chief feature of interest. The officials are straining every nerve to lay the rails to Chihuahua by Sept. 16, the Mexican Fourth of July, when the anniversary of Mexican independence is celebrated. At the date of writing the end of the rails is only about seven and a half miles from the city. There is plenty of steel to complete the distance, but a lack of bridge material for crossing two or three *arroyas*. This, with the wash-outs, has delayed the progress, but there is little doubt that the rails will be laid to the Chubiscar River, on which Chihuahua is situated, by the opening of the *fiesta*. It was about August, 1881, that the first spike was driven here on the Mexican side of the Rio Grande, but it was not until November that the work began to be pushed ahead. The construction is stated to have cost about $3,000 a mile for surveys and grade, and about $7,000 for rails, ties, etc., the total cost per mile being under $12,000, or less than the amount of the government subsidy. This comparatively moderate amount, about half that of the construction of the Southern Division of the Mexican Central from the city of Mexico to Leon, is due to the level character of the country between here and Chihuahua. For the greater part of the 225 miles the railroad runs through the centre of a valley, or rather plain, varying from 15 to 30 miles in width, with the foot hills of the Sierra Madre Range on the west and on the east a line of mountains and steep rocky hills which often bear a striking resemblance to the Palisades of the Hudson. The heaviest grade encountered has been only 7-10 of 1 per cent., and very few cuts have been necessitated except immediately south of this town.

The extent to which Mexico, although a republic, remains a feudal aristocracy is illustrated by the curious fact that nearly all the land from here to the city of Chihuahua, a distance of 225 miles, is owned by about half a dozen men. Don Innocente Ochra owns most of the land from El Paso south to Sanualayucca, Dr. Samienego owns from Candelaria to Ojo Calliente, and Governor Terazas and Henry Miller, together hold all the land from Chivalito to Sauz, a distance of about 125 miles. From Sauz to Sacramento the land belongs to the Curate Jose de la Luz Corral, and then come several small owners. Laborsita and Saitre belonging to General Trias' daughters, Nombre de Dios to a little colony, the land just above Chihuahua being owned by Henry Miller. In regard to the strip of 125 miles held by Governor Terazas and Mr. Miller, there is a little bit of sorrowful romance. This formerly belonged to the estate of Don Martinez del Rio, who unwisely joined the French Empire and cast in his lot with the ill-fated Maximilian. In return his estates were confiscated, as some claim illegally and through political influence, and passed into the hands of their present owners. Don del Rio, failing to win back his property, has settled down in the city of Mexico to pass a disappointed old age, but his two sons have taken up the struggle and are devoting themselves to the attempt to have their father's lands restored.

Perhaps it may not prove uninteresting if I briefly sketch the new and yet old country which the railroad has opened to travelers from the North. South of El Paso for perhaps thirty miles are the sand hills. The surface of the land is broken into irregular hillocks, sand dunes whose dazzling whiteness gleams through the mesquite, thorn-bushes and cacti, with which they are scantily covered. Sometimes the traveler catches a glimpse of a heavily laden pack-train crawling among the dunes toward the Rio Grande. These are smugglers, whom the railroad has certainly benefited in one respect, by driving away the Apaches who were formerly their terror. But it is only a short time since the engineeers and contractors, the true pioneers of civilization, risked their lives in paving the way for this road, and even met death, for the course of the Mexican Central has been marked by bloody tragedies.

Just at the southern limit of the sand hills, about forty-four miles below this town, and not far from Candelaria, four crosses can be seen from the car windows, standing on a low hill to the east. They mark the spot where in June of last year four engineers, Fordham, Grew, Leavitt and George made a desperate and unavailing fight against a horde of Apaches. They were attacked while driving along the trail in a wagon. Grew and the driver were probably killed at the first fire. The others sheltered themselves as best they could on the hill and fought until their ammunition gave out. Only their horribly mutilated bodies surrounded by empty cartridge-shells remained when a rescuing party arrived too late. Wallace, after receiving his first wound, scooped a hole in the sand and concealed his money, amounting to several hundreds of dollars with drafts and time checks, and when his corpse was raised for burial the idea of instituting a search revealed this money hidden just

underneath his body. Nothing was known of his family, and no friends nor relatives appeared to lay claim to this melancholy legacy which is still on deposit with the railroad company. Hardly a mile below this spot four contractors, Black, Bell, Chambers and Lewis met a similar fate in November last. They were on horseback and kept up a running fight with the Indians for some ten miles. Then the ground became sandy, and finding they could not escape they rode to the summit of a little hill, shot their horses, and lying behind the bodies fought as men only fight when their lives depend on the issue. When their mangled bodies were found every cartridge had been shot away and the bushes and cacti along the hill top were literally mowed down by the leaden hail. It was the same gang of Apaches that struck the stage just below, killing the driver and taking off young Pugh, son of ex Senator Pugh. He had time to write a note of agonized entreaty for help which was found on a mesquite bush, but when the troops arrived they discovered his body half a mile away under circumstances that showed he had been put to death with the most dreadful tortures. All these savages were probably Apaches from the Mescalero Agency in New Mexico, to which they quietly returned unpunished after their bloody work, and the agent excused them by the claims that these four contractors had first attacked the Indians, who numbered a large party.

These are some of the incidents recalled before the sand hills and the frowning peaks of Candelaria and Rancheria are left behind. Then comes a rather rough grazing country. At Ojo Caliente—hot springs—is the ranche of Dr. Samienego, where there is a wonderful spring, the sides and bottom studded with petrifactions, mastodons' teeth, and fossil bones. Near Cuivalito ran the trail most frequented by the Apaches on their way from the Sierra Madre range across to the Eagle Pass into Texas, and on many of the mountain peaks are little stone hiding-places where their scouts lay and watched up and down the valley. Laguna takes its name from a lake some five miles long near the railroad station. Below Gallego the plain becomes wider, more level, like the prairies in Eastern Kansas, and at this season is covered with a luxuriant growth of gramma grass. That the value of this grass is appreciated is shown by the great herds of cattle that are scattered along the plains all the way from Gallego to Sauz. On the Encinillas and Sauz ranches, belonging to Governor Terazas and Mr. Miller, are 135,000 head. Below Sauz the railroad passes close under neath the Sacramento bluff, as the Mexicans expected the American soldiery to do when they built the earthworks, which still remain, in the Mexican War, but they were greatly discomforted when the Americans saw fit to flank and take them in the rear. Then the plain becomes wider but less fertile, and mesquite, thorn-bushes and cacti are substituted for the gramma grass, although on the east a line of trees and green meadows marks the course of the Sacramento River. Continuing several miles further one comes across the boarding train where the workmen eat and sleep, and a few miles below is a construction train unloading rails and ties, the latter of which are carted ahead and put in place along the dump. To the south, apparently at the end of the valley, the white towers of Chihuahua are visible, near by on the east are two little villages of unknown age. Every afternoon the workmen are surrounded by Mexican caballeros, who ride up to behold a locomotive for the first time, and who, when the train starts back, race wildly alongside like the antelopes above Sacramento. It is a curious fact that the railroad does not actually pass through a single town in its whole course through the state of Chihuahua. The stately haciendas of various dons can be seen here and there among the trees on the sides of the valley, and there are several small villages some distance from the line of the road. The nearest, I belive, is Sacramento, some three miles away, where I beheld one morning almost the entire population mounted on the flat roofs of the adobe houses to see the construction train puff its way southward. And the nearest approach to a village actually on the line is the ranche at Encinillas, which is one immense square adobe building surrounding courtyard and corrals, and divided into a multiplicity of rooms, like the houses in a tenement block, which furnish shelter for a colony of herders and their children, who are as numerous as rabbits in a warren.

In another letter the same correspondent says of the resources of the state of Chihuahua and the effect of the railroad at this time:

As regards the effect of the railroad, Chihuahua presents reasons good in themselves for the quickening of trade, the enlistment of capital and the development of new industries. The Sierra Madre range and nearly all the mountains between this state and Sonora are rich in gold, silver and copper. It seems probable that the great mineral centre of the Continent will be disclosed among these mountains at the point where the Sierra Nevada and Rocky Mountains unite. Westward from this city are the famous Batopilas mines, showing true fissure veins of native silver in decomposed quartz, where "Boss" Shepherd, whose memory abides in the District of Columbia, is reaping abundant rewards for himself and the Eastern capitalists who have purchased the mines. To the southwest is Parral, which would be a Leadville were it in the United States, and in the same general region Cuirisihuac, and a dozen mining camps, all showing fine properties. Of the mining region as well as of the entire state this city with the mint and government buildings is naturally the centre, although in one instance—at Batopilas—the bullion is shipped westward across Sonora to the Pacific coast. Between this city and El Paso are grazing grounds with abundance of gramma grass from July until January, and which, as has already been done to a very limited extent, can be rendered in part available for agriculture by the employment of capital in irrigation. In the southern part of the state cotton-growing is largely carried on, and there are many vineyards, while the merits of Chihuahua corn and wheat have already become known. The climate is even at this time not at all oppressive. During the middle of the day the sun's rays are very hot, but it is a dry heat that is not severely felt. The evenings and nights are always cool and even chilly. Simply as a winter resort the clear, pure air and beautiful mountain scenery about the city offer many attractions.

* * * * * * * *

Since the near approach of the railroad there has been a general rise in prices, sometimes to three times the former amount. This has been shown particularly in building material, real estate and rents. A large house near the plaza formerly renting for $60 a month now commands $120, and a store near by rents for $150 as against $50 a year ago. The increase in rentals has been followed by an increased taxation upon real property. But while the majority of the wealthy citizens have been buying up houses and lands and felicitating themselves on the rise, others have improved the opportunity to sell all they possessed. The reason given for this course is the fear that the location of the freight depot, round-house and shops on the other side of the river may cause the growth of a new town, which will monopolize the benefits expected from the railroad. But the general opinion is that the advent of mills and smelters will make Chihuahua more than ever a mining centre, that the abandoned woollen factory will be set running, and that new manufactures will give fresh life to the city. The price of labor has shared the universal rise. Where peons could be hired for three bits a day, they now obtain six bits and a dollar.

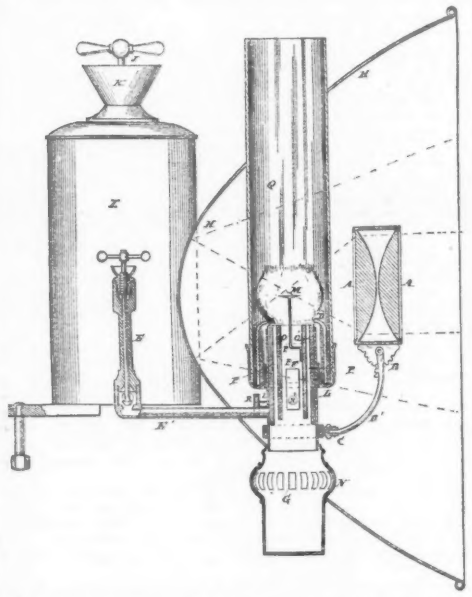
Schubert & Carswell's Locomotive Head-light and Lamp.

Mr. Robert E. M. Schubert, of Philadelphia, and Edwin T. Carswell, of Wilmington, Del., have patented an improvement in head-lights, shown by the engraving and described as follows in their patent:

The engraving represents a vertical sectional view of the lamp, lens, reflector and the stem-valve, showing the oil-feed pipe and oil-reservoir in elevation.

A is a movable lens in front of the light; *B* a hinge for directing the rays of light through the lens upward or downward, which is accomplished by inclining the lens backward or forward; *B'*, a curved support or bracket to sustain the lens; *C*, a hinge to enable it to be moved from side to side to throw the rays of light sidewise. *D* is a glass or transparent shield or inverted cup enveloping the burner, having an upper opening for the flame, which, while serving the usual purpose of shaping or giving form to the flame, also permits the rays of light to pass through it, whereby no shadow is cast. The metal shields of the same form are old, but are objectionable because of their opaqueness. *E* is a stem-valve, connected by means of a short pipe with the reservoir *I*, to regulate and control the flow of oil from the reservoir *I* through the tube *E'* to the wick-chamber *F*; *G*, the air-supply openings for sustaining combustion; *H*, the ordinary head-light reflector. *I* is the oil-reservoir, having a screw-cap *J* in the bottom of a funnel-neck *K*. *L* is the lamp; *M*, the flame of the same. *N* are sides round the openings *G*, which can be made to envelop the same by pushing them back more or less, the amount of air passing through openings *G* being regulated thereby. *O O'* are wick-tubes formed of concentric double-walled cylinders. The cylinders contain the concentric tubular wicks, and between these cylinders, and in the interior of the smallest one, are air-spaces *P P*, which communicate with the openings *G*, for the purpose of suppling air to the flame *M*. *Q* is the lamp-chimney, *R* is a thumb-wheel furnished with the ordinary ratchet or spur wheels to turn the wicks. The outer concentric tube *O'* and its wick are pierced with a long vertical slot near the bottom, to permit the passage through said outer tube or cylinder of the shaft of the wick-elevator or spur-wheel *R*, by the turning of which the interior wick is turned up.

For increased power we have shown a double lens *A A*, although one lens may be used, if desired. The joint *C* enables the lens to be turned from side to side, so as specially to illuminate one or the other side of the track, though this joint will be seldom used. We find that the joint *B* is all that is absolutely necessary, as by throwing the lens slightly forward, so that the ray of light is deflected until it strikes the ground closely in front of the engine, it will be broad enough where it strikes the track to illuminate both rails thereof, so that the engineer is thereby enabled to judge or to see exactly what distance he has passed a switch, and obviates the necessity of his going back a considerable distance to make sure that he has passed it sufficiently to enable it to be closed or changed, which he would have to do if he were compelled to back until the reflection from the head-light struck the switch. Thus considerable valuable time is by our device saved in making up and shifting trains and cars and in changing from one track to another.



Schubert & Carswell's Locomotive Head-Light.

The concentric tubular wicks, each having a full supply of air, enable us to produce a solid intense white light, having equal illuminating power or capacity on every side because of its roundness.

We construct the transparent shield *D* of glass. It is of the ordinary form of burner-shields, and fulfills its office in the same way as other shields, but from its transparency does not intercept the rays of light or cast a shadow.

Passenger Train Service in London.

The following account of the immense passenger train service of London appeared in the *Railway News* last January:

Perhaps one of the most remarkable features of modern London is the wonderful facility with which one can get away from it. One need only glance at the time bills at any of the large stations to see the number and frequency of trains leaving London both for the suburbs and long journeys, but it will perhaps hardly be credited that every day (*i. e.*, every 24 hours), upwards of 2,000 trains leave London, of which nearly 1,600 are between the hours of 10 a. m. and 10 p. m., and more than 700 of which are for long journeys, *i. e.*, upwards of 25 miles. In the following table under the heading "suburban" are included all trains running a less distance than 25 miles, and "main line" refers to all trains running a greater distance, whether on the main line proper or not.

There are in the metropolis 14 terminal stations, in the strict sense of the word, viz., Paddington, Euston, St. Pancras, King's Cross, Holborn Viaduct, Broad street, Liverpool street, Cannon street, Fenchurch street, Moorgate street, London Bridge, Waterloo Bridge, Charing Cross and Victoria. This does not include the termini of the Metropolitan and District Railways, the departures from which are not included in the table. The largest amount of traffic is at Liverpool street station, from which more than 320 trains depart each day; Victoria and Broad streets come next with 312 and 295 departures respectively. St. Pancras has fewest, viz., about 40:

	Suburban. 5 a.m. to 10 a.m.	Suburban. 10 a.m. to 10 p.m.	Suburban. 10 p.m. to 5 a.m.	Main line. 5 a.m. to 10 a.m.	Main line. 10 a.m. to 10 p.m.	Main line. 10 p.m. to 5 a.m.	
Termini:							Total.
Paddington—							
Great Western	4	17	2	8	26	1	58
Euston—							
London & N. W	1	14	2	8	27	1	53
St. Pancras—							
Midland	4	4	1	4	17	1	31
Great Eastern	..	...	....	2	8	...	10
King's Cross—							
Gt. Northern	7	5	3	6	25	1	47
Broad street—							
North London	38	124	16	..	..	..	178
London & N.W.	12	43	1	..	2	..	58
Gt. Northern	19	39	1	..	..	..	59
Liverpool street—							
Great Eastern	41	143	20	7	22	2	235
L., B. & South Coast	18	47	5	..	1	..	71
South Eastern	3	11	1	..	..	..	15
Holborn Viaduct—							
London, Chat. & D.	9	21	5	5	23	1	64
Fenchurch street—							
L., Tilbury & South	4	14	2	2	11	..	33
Great Eastern	31	132	8	..	..	..	171
Moorgate street—							
Great Northern	17	44	4	..	..	..	65
Midland	14	40	4	..	..	..	58
London, Chat. & D.	13	50	7	..	..	..	70
Great Western	1	5	1	..	..	..	7
London Bridge—							
L., B. & South Coast	41	118	12	8	35	2	216
Cannon street—							
South Eastern	6	11	.	..	4	..	21
Charing Cross—							
South Eastern	18	71	9	10	43	3	154
Waterloo Bridge—							
Lon. & S. W	31	105	14	15	34	3	202
Lon. & N. W	2	11	1	..	..	..	14
Victoria—							
L., B & South Coast	17	78	9	7	36	3	150
L., Chat. & D.	24	55	11	6	28	1	125
Lon. & N. W	3	9	1	..	..	..	13
Great Western	..	5	..	..	..	..	5
Great Northern	1	12	....	..	..	..	13
Midland	1	4	1	..	..	..	6
	380	1,232	141	88	342	19	2,202

To account for the small figures opposite King's Cross and Cannon street some explanation is necessary. About 80 trains, chiefly to the suburban districts, leave, or rather pass King's Cross daily, that part of the station which they depart from being designated "Sub." in the time tables, in distinction to "G. N. R.," the main line platform. These trains actually do depart from King's Cross; but, as they originally start from Victoria or Moorgate street, they are entered under these stations respectively. Cannon street is not a terminal station proper, as almost all the trains from it start from Charing Cross, and, if put down as leaving Cannon street, would be entered twice. Those in the table are those which leave Cannon street only, *i. e.*, do not come from Charing Cross; therefore, although only shown as 21 the actual number is about 150. Three more stations, not given in the table, which deals only with termini proper, merit brief notice. The Southeastern Railway Company's London Bridge station is practically what might be called a "roadside," as no trains commence their journeys there; about 160 pass it during the day to the suburban and main lines. Ludgate Hill is also a "roadside" station, although it forms the terminus of a suburban service of the London & Southwestern Railway, 26 trains of this company departing, and upwards of 200 trains of the London, Chatham & Dover, Great Northern, and Midland Railways passing through it daily. Addison Road station, Kensington, on the West London line, is only the terminus of a joint service of trains of the London, Brighton & South Coast, and London & Southwestern Railways to Clapham Junction, between thirty and forty trains run each way daily; in addition, considerably more than 200 trains pass through this station every day, but any details respecting them belong rather to the Metropolitan railways, which are too extensive and complex to be considered in the present article. Of the 450 "main-line" trains leaving London daily, the following run through to Scotland, or form an indirect communication with steamers to Ireland and the Continent:

Through trains to Scotland:

	Trains.
From Euston, Lon. & N. W	7
" St. Pancras, Midland	3
" King's Cross, Great Northern	5
	15

Trains in connection with Irish steamers:

From Euston, Lon. & N. W	6
" St. Pancras, Midland	1
" Paddington, Great Western	1
	8

Trains in connection with continental steamers:

From Charing Cross & Cannon street, Southeastern	4
" Holborn Viaduct, L. C. & Dover	4
" Victoria " "	4
" " L. B. & S. Coast	1
" Waterloo Bridge, L. & Southwestern	1
" Liverpool street, Great Eastern	1
" Paddington, Great Western	1
	16

Any account of the train service from London would be incomplete without a reference to the Pullman cars, which, regarded first as curiosities, have now taken their place amongst the ordinary railway carriages of the country. They are only in use, as yet, on three railways, the Great Northern, Midland, and London & Brighton. They are of two kind, drawing-room and sleeping cars, and are run from London to the undermentioned places as follows:

Drawing-room cars:	
St. Pancras (Midland) to Manchester and Liverpool	4 times daily
St. Pancras (Midland) to Glasgow	once "
King's Cross (Great Northern) to Leeds (Dining-room car)	once "
Victoria (London, Brighton & South Coast) to Brighton	once "
Victoria (London, Brighton & South Coast) to Brighton (Pullman car train)	twice "
Sleeping cars:	
St. Pancras (Midland) to Glasgow and Edinburgh	once "
St. Pancras (Midland) to Liverpool and Manchester (car train)	once "
King's Cross (Great Northern) to Edinburgh and Glasgow	once

Size of Steam-Ports and Passages.

Such of our readers as have made for themselves a toy engine (and we incline to the belief that the number will be found not inconsiderable), and have watched it whirling away at a speed of some 2,000 or 3,000 revolutions per minute might naturally be led to the conclusion that there was no limit to the velocity with which steam can travel, or to the speed with which it can enter and pass out of the cylinder, and its motion be changed or reversed. Such a notion, however, would be in the highest degree erroneous, as the speed at which steam travels on its way to or from the cylinder of a steam-engine is an important factor in determining the best size of the steam passage ports, etc. It has been found by experiment that so long as the steam in a pipe is not required to travel at a higher rate of speed than 100 ft. per second, 6,000 ft. per minute, the loss from friction, etc., in the pipes and passages is not a serious one, and the pressure at which it can be obtained on the piston is not much reduced from the boiler-pressure. Beyond this speed, however, serious loss of pressure takes place, and hence the importance of having the steam-ports so large that the velocity referred to may not be exceeded.

Those engineers who have had much experience in the overhauling of steam-engines, are aware that in a large number of old engines the ports and passages in the cylinders are very much too small.

In a case which recently came under the notice of the writer the area of the steam-port was not more than one-thirtieth of the cylinder area, and the loss from wire drawing, poor vacuum, etc., was in consequence very considerable, although the piston speed was not a high one.

When the steam-ports and passages of an engine are too crippled there is, in addition to the loss from wire drawing, etc., a further loss of power from the increased resistance to the exit of the steam from the cylinder, causing what is known as "back pressure."

In condensing engines, even though there may be a plentiful supply of cold water and a good vacuum in the condenser, when the exhaust passages are tortuous and contracted an exceedingly poor effect of the vacuum will be obtained in the cylinder. Perhaps as good an illustration of

FIG. 1

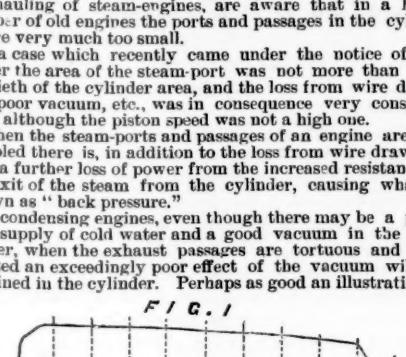
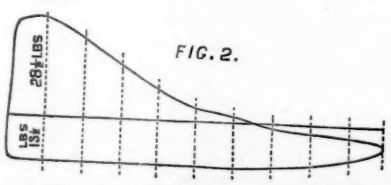


FIG. 2.



this as could be obtained is shown in the diagrams (figs. 1 and 2) taken from a condensing engine some time ago in the south of England. The engine was furnished with a cut-off valve, by means of which the steam could be cut off at any desired portion of the stroke. In fig. 1, it will be observed, the steam is admitted during about nine-tenths of the piston's stroke, and, when released, escapes with such difficulty through the contracted exhaust passages that the back pressure exceeds that of the atmosphere during three-tenths of the return stroke, and, at the termination of the stroke, when the full effect of the vacuum is usually obtained in the cylinder there is an absolute back pressure of something like 6 lbs. That is to say, to use the common expression, the vacuum is only 9 lbs. Fig. 2 was taken from the same engine, immediately after fig. 1, when driving a much lighter load and the steam cut off at about one-sixth the stroke. The quantity of steam to be condensed is here so much less that a vacuum of 13½ lbs. is now shown in the cylinder, and although the effect of the restricted exhaust passages is still seen at the commencement of the exhaust a very much greater effect is obtained from the vacuum throughout the stroke than under the conditions shown in fig. 1. Hence, we see that, besides the loss of pressure in admission when the ports and passages are too small, an even still greater loss is experienced from the back pressure, resulting from the resistance to the egress of the steam.

Many rules have been given for determining the size of steam-ports, etc.; but none can be considered as other than empirical which does not take into account the fact abovementioned, that the velocity of the steam in following a piston should not in the passages exceed 100 ft. per second, or 6,000 ft. per minute. Bearing this in mind, we shall see that the area of the steam-ports should have the same ratio to the area of the cylinder that the piston speed in feet per minute has to 6,000, from which we easily deduce a rule thus:

$$\text{Area of port} = \frac{\text{Area of cylinder} \times \text{piston speed in feet per minute}}{6{,}000}$$

A rule in very general use amongst engineers, and to be found in most engineering pocket-books, is to make the area of steam-port equal to the area of cylinder. Let us see how this corresponds with the rule we have just found. Take for example, say, an engine having a 5-ft. stroke running 50 revolutions per minute; that is to say, with a piston speed of 500 ft. per minute. By our rule we have

$$\text{Area of port} = \frac{\text{area of cylinder} \times 500}{6{,}000} = \frac{\text{area of cylinder}}{12}$$

so that we see for 500-ft. piston speed the common rule of making the steam-port equal to the cylinder area would give too small a passage, the port requiring to be not less than the cylinder area, in order not to lose pressure and power from the entering steam having too high a velocity. If the piston speed were only 400 ft., the port might be made only area of cylinder, because

$$\frac{\text{area of cylinder} \times 400 \text{ ft. per minute}}{6{,}000} = \frac{\text{area of cylinder}}{15}$$

and so, if the piston speed were still further reduced, the common rule would give a larger steam-port than is necessary. In order to avoid the great loss experienced by restriction of the exhaust, as shown in the above diagrams, it is customary to make the exhaust-ports about half as large again as the steam-ports, so that the egress may be as free as possible, and the back-pressure on the piston reduced to a minimum. There being, then, so much advantage in having large passages to and from our cylinders, the consideration naturally arises as to what conditions determine the limits in the opposite direction; or, can we really make the steam-passages, etc., too large? It is well known that too much clearance space at the ends of a cylinder means loss of steam at each stroke of the piston, and in the same way an excessive capacity of steam-port or thoroughfare would mean waste, through more steam having to be thrown away in exhausting the passages than is really necessary. A further consideration respecting the disadvantage of having too great width and area of ports is found in the cobling influence of exhaust steam, the temperature of which, at or below atmospheric pressure, is very much lower than that of the fresh steam at its entrance to the cylinder. The passage of the exhaust-steam through the same ports as the high-pressure steam has to pass through, abstracts a considerable amount of heat from every part of the metal with which it comes in contact, and this heat has to be supplied again by the entering steam at each stroke. The question, therefore, of having the steam ports of an engine a proper size, and neither too small, so as to cause loss from wire-drawing, back-pressure, etc., nor too large, so as to give rise to loss from cooling, etc., it will be seen is one which has a material influence on economical working. The rule we have given is a practical one, and we can recommend it from long personal experience.—*English Mechanic.*

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette:*

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Baltimore & Hanover	634
Baltimore & Potomac	369
Bangor & Piscataquis	190
Boston, Concord & Montreal	345
Boston & Lowell	49
Buff., Pittsburgh & Western	484
Bur., Cedar Rapids & No.	345
Cairo & St. Louis	590
Camden & Atlantic	493
Canada Southern	269
Canadian Government Bonds	126
Cape Fear & Yadkin Valley	324
Central Iowa	122, 340
Central, of Georgia	661
Central, of New Jersey	264
Central Pacific	217, 644
Central Vermont	645
Charlotte, Col. & Augusta	23
Chesapeake & Ohio	157, 189
Chesapeake & Ohio Canal	420
Cheshire	324
Chicago & Alton	141
Chicago, Bur. & Quincy	217, 223
Chicago, Mil. & St. Paul	175, 286, 296
Chicago & Northwestern	494, 497
Chicago, R'k I'd & Pacific	310, 420
Chicago, St. P., Minn. & Om.	193, 279
Cin., Hamilton & Dayton	370
Cin., Ind., St. L. & Chi.	386, 516, 590
Cin., New Orleans & Tex. Pac	71
Cleve., Col., Cin. & Indianapo.	245
Cleve., Tuscarawas Vy. & Wh.	190
Columbia & Greenville	7, 647
Columbus, Hocking Vy. & Tol.	222
Concord	339
Conn. & Passumpsic Rivers	590
Connecticut River	70
Consolidation Coal Co.	195
Cumberland Valley	217
Delaware	54
Delaware & Hudson Canal	101, 176
Delaware, Lacka. & West	71
Del., Lack. & W. Leased Lines	340
Delaware Western	41
Denver & Rio Grande	71, 314
Des Moines & Ft. Dodge	101
Detroit, Grand Haven & Mil.	404
Detroit, Lansing & No.	466
Eastern R. R. Association	281
Eureka & Palisade	324
Fitchburg	40
Flint & Pere Marquette	523
Galveston, Har. & San Ant'o	466
Georgia	340
Grand Rapids & Indiana	324
Grand Trunk	222
Great Western	289
Hannibal & St. Joseph	176
Han. J'n., Hanover & Gettysb'g	324
Housatonic	195
Houston, East & West Texas	190
Houston & Texas Central	126
Huntingdon & B'd. Top Mt.	101
Illinois Central	96, 125
Indiana, Bloom. & West	492
Indianapolis & St. Louis	340
Iowa Minor Railroads	71
Junction & Breakwater	345
Kan. City, Ft. Scott & Gulf	310
Kan. City Lawrence & So. Kan.	183
Kentucky Central	195
Knox & Lincoln	142
Lake Shore & Mich. So.	271, 279
Lehigh Coal & Navigation Co.	126
Lehigh Valley	41, 100
Little Rock & Ft. Smith	339
Long Island	71
Louisville, Cin. & Lexington	54
Louisville & Nashville	450, 622, 637
Louisville, New Alb. & Chi.	142
Manchester & Lawrence	340
Massachusetts Minor R. Rs.	218
Memphis & Charleston	498
Mexican Central	217
Michigan Central	287, 295
Mil., Lake Shore & Western	403
Minnesota R. R. Commissioner	54
Mississippi & Tennessee	41
Missouri Pacific	190
Mobile & Girard	493
Mobile & Ohio	398
Montpelier & Wells River	420
Nash., Chattanooga & St. L.	622
Natchez, Jackson & Col	101
New Haven & Northampton	100
New London Northern	345
N. Y., Lake Erie & Western	95
N. Y., N. Haven & Hartford	6
N. Y., Ontario & Western	96
N. Y., Pennsylvania & Ohio	190
N. Y., Susquehanna & West	296
Norfolk & Western	55
Northeastern (S. C.)	55
Northern Central	125
Northern (New Hampshire)	344
Northern Pacific	596
Ogdensb'g & L. Champlain	386
Ohio Central	569
Ohio & Mississippi	65
Ohio Southern	466
Oregon & California	404
Oregon Ry. & Nav. Co.	496, 661
Oregon & Transcontinental Co.	516
Pacific Mail Steamship Co.	370
Panama	217
Pennsylvania Company	563
Pennsylvania & N. Y.	100
Pennsylvania Railroad	157
Pensacola & Atlantic	246
Pensacola & Perdido	324
Perkiomen	71
Petersburg	199
Philadelphia & Reading	7, 220
Philadelphia, Wil. & Balt.	22
Pittsburgh & Castle Shannon	142
Pittsburgh, Cincinnati & St. L.	282
Pittsburgh & Lake Erie	23
Portland & Ogdensburg	96
Portland & Rochester	126
Providence & Worcester	246
Pullman's Palace Car Co.	589
Queen Anne's & Kent	388
Richmond, Fred. & Potomac	216
Rochester & Pittsburgh	6
Ruby Hill	324
Rutland	483
St. Johnsbury & Lake Champ.	516
St. L., Alton & Terre Haute	550
St. Louis & San Francisco	11 175
St. L., Vandalia & Terre Haute	484
St. Paul & Duluth	217
St. Paul, Minn. & Manitoba	564
Sandy River	190
Savannah, Florida & West	217
South Carolina	189
South Carolina Minor R'rds.	7
Southern Pacific	450
Sussex	386
Terre Haute & Indianapolis	483
Terre Haute & Logansport	484
Texas & Pacific	569
Troy & Greenfield	70
Union Pacific	175
United New Jersey	449
U. S. Rolling Stock Co.	195
Utica & Black River	70
Vermont Valley	403
Vicksburg & Meridian	450
Virginia Midland	142
Virginia & Truckee	160
Wabash, St. L. & Pacific	194, 218
Western Maryland	7
Western R. R. Association	38
Western Union Telegraph	645
West Jersey	622
Wilmington & Northern	439
Worcester & Nashua	55
Wisconsin Central	370

Western Maryland.

This company works a main line from Baltimore to Williamsport, Md., 90 miles; the Emmettsburg Branch, 7 miles; the Baltimore & Cumberland Valley, from Edgemont, Md., to Shippensburg, Pa., 34 miles, making a total of 131 miles. The statements below for the year ending Sept. 30 were presented at the annual meeting last week. The mileage for the preceding year was 104½ miles.

The road is chiefly owned by the city of Baltimore, which holds a majority of the stock and endorses most of the bonds.

The earnings were as follows for the year:

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Earnings	$540,149	$461,871	I. $78,278	16.9
Expenses	364,491	375,919	D. 11,428	3.0
Net earnings	$175,658	$85,952	I. $89,706	104.3
Gross earn. per mile	4,123	4,399	D. 276	6.3
Net " "	1,341	819	I. 522	63.7
Per cent. of expenses	66.94	81.39	D. 14.45	.....

The expenses include rental of Hillen station in Baltimore, which is owned by the city.

The President's report says: "Of the net revenue, $59,677.99 was expended in the purchase of new equipment; also, large amounts in steel rails, iron bridges, new buildings, sidings and other improvements, and additions made necessary for the accommodation of a rapidly-increasing business. Notwithstanding the large increase above shown, the company's operations have been very much cramped by its not having the necessary capital to change the character of the various appointments to meet the exigencies of its new position. Only a few months since, its business and characteristics were entirely local; and without the means in hand to make the necessary provision, it is now called upon to do service as a through line.

"An ordinance authorized by a recent act of the Legislature has been passed by the City Council, and was ratified by popular vote on Oct. 25, by which the Commissioners of Finance are authorized to make to the company a 4 per cent. loan of $684,000, this amount being the estimated cost of completing the steel track, the erection of iron bridges, and for making the necessary additions to the equipment."

Lake Erie & Western.

This company owns a line from Sandusky, O., to Bloomington, Ill., 376.8 miles, with a branch from St. Mary, O., to Minster, 9.2 miles, being 386 miles in all. The report is for the year ending June 30.

The equipment consists of 43 engines, 34 passenger train cars and 1,589 freight cars. There was an increase of 123 freight cars during the year.

The general account is as follows:

Stock		$7,700,000
Bonds		7,887,000
Bills, accounts and balances		374,345
Total		$15,961,345
Road and equipment	$15,645,095	
Materials	129,285	
Bills and accounts receivable	56,498	
Cash	61,234	
Debit balance of income	69,233	
		$15,961,345

The bonded debt was reduced $20,000 during the year; it consists of $2,500,000 LaFayette, Muncie & Bloomington first-mortgage and $1,000,000 income bonds; $487,000 Sandusky Extension first mortgage and $600,000 income bonds; $1,815,000 general first-mortgage bonds and $1,485,000 income bonds.

The traffic for the year was as follows:

	1881-82	1880-81.	Inc. or Dec.	P.c.
Passengers carried	496,518	363,582	I. 132,936	44.5
Passenger miles	13,423,817	10,832,564	I. 2,591,253	23.9
Tons freight carried	804,203	675,592	I. 128,611	19.0
Ton-miles	105,771,900	92,168,262	I. 13,603,638	14.8
Av. receipt:				
Per passenger mile	2.480 cts.	2.980 cts.	D. 0.500 ct.	16.8
Per ton-mile	0.885 "	0.995 "	D. 0.110 "	11.1

A large part of the traffic is through business which must be taken at very low rates.

The road has been generally improved in condition and the equipment both improved and increased.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P.c.
Freight	$936,008	$916,969	I. $19,039	2.1
Passengers	332,608	323,474	I. 9,134	2.8
Other	155,397	171,333	D. 15,936	9.4
Total	$1,424,013	$1,411,776	I. $12,237	0.9
Expenses	1,154,080	1,094,203	I. 59,877	5.5
Net earnings	$269,933	$317,573	D. $47,640	15.0
Gross earn. per mile	3,689	3,657	I. 32	0.9
Net " "	699	823	D. 124	15.0
Per cent. of expenses	81.0	77.5	I. 3.5	.....

The interest paid during the year was $312,255, leaving a deficit of $42,322 for the year.

The General Manager states that, owing to circumstances entirely beyond the power of any one line of railway to control, the war in rates was continued during nearly the entire fiscal year, thus depriving the company of a very large net revenue. Last year they received an average of $1.357 per ton on all freight moved; this year but $1.1639 per ton, showing a loss of 19.31 cents per ton. This amount on 804,803 tons of freight moved shows a loss to the company in net revenue of $155,291. There was an increase this year of 128,611 tons of freight moved, which consisted largely of local merchandise and west-bound traffic.

The explanations given for some of the charges in earnings are as follows:

"Decrease of $77,183 in local freight revenues. This loss was attributable entirely to generally poor crops throughout the grain belt tributary to our line. The decrease in mileage revenue for the use of our cars on foreign lines, may be fairly charged to two causes: First, the largely increased west-bound traffic, coming to us almost entirely in foreign cars, which, for want of facilities, and the necessity for prompt delivery, prevented our transferring, and, second, the large and never before seriously felt demand for the grain from our territory for the extreme Southern markets. The want of properly organized freight lines for handling this traffic, with the consequent great delay in getting our cars returned, prevented their earning revenues from that direction. The growing importance of this road as a link in the great through lines from the East to the West is well exemplified in the item of $96,221 increase in through or foreign revenues, this amount being largely derived from earnings on west-bound traffic."

Boston & Albany.

The company's statement to the Massachusettts Railroad Commission for the year ending Sept. 30 has been made, and the figures given below are taken from it.

The traffic for the year was as follows:

Passengers.	1881-82.	1880-81.	Inc or Dec.	P.c.
Through	1,416,936	1,280,324	I. 136,612	10.7
Local	6,107,202	5,518,854	I. 588,348	10.6
Total	7,524,138	6,799,178	I. 724,960	10.7
Passenger-miles	151,255,032	135,521,102	I. 14,733,930	10.9
Tons freight:				
Through	1,632,990	1,798 309	D. 165,319	9.2
Local	1,782,339	1,795,614	D. 13,275	0.7
Total	3,415,329	3,593.923	D. 178,594	4.9
Ton miles	374,317,338	417,108,612	D. 42,791,274	10.3
Av rate:				
Per pass.-mile	1.99 cts.	1.97 cts.	I. 0.02 ct.	1.0
Per ton-mile	1.07 "	1.04 "	I. 0.03 "	2.9

Last year there were 2,398,045 passengers carried to Boston, and 2,447,866 from Boston.

The number of miles reported is 369, against 372 the previous year. The company has now 245 locomotives and 5,858 cars.

The earnings for the year were as follows:

	1881-82.	1880-81.	Inc. or Dec.	P.c.
Freight	$3,984,132	$4,328,906	D. $344,774	8.0
Passengers	3,014,161	2,668,045	I. 346,116	12.9
Mail, etc	792,080	878,334	D. 86,254	9.8
Total	$7,790,373	$7,875,285	D. $84,912	1.1
Expenses	5,600,991	5,688,412	D. 87,421	1.5
Net earnings	$2,189,382	$2,186,873	I. $2,509	0.1
Gross earn. per mile	21.112	21,170	D. 58	2.7
Net " "	5,933	5,879	I. 54	0.9
Per cent. of exps	71.9	72.2	D. 0.3	....

In expenses there was a decrease of $99,273 in maintenance of way, of $211,958 in maintenance of buildings and docks, of $55,785 in maintenance of cars, with an increase of $64,495 in maintenance of engines, of $206,342 in transportation expenses and of $8,757 in general expenses.

The income account was as follows:

Net earnings, as above		$2,189,382
Interest	$566,450	
Rentals	75,000	
Dividends, 8 per cent.	1,503,550	
		2,145,000
Surplus for the year		$44,382
Surplus, Oct. 1, 1881		2,588,539
Surplus, Oct. 1, 1882		$2,632,921

There was an increase in interest payments and a decrease in dividends, owing to the exchange of the Massachusetts state stock for the new bonds. The total amount, however, of interest and dividend payments was the same as last year.

During the year 33 persons have been killed—25 by their own carelessness, 7 employés and 1 passenger, a prisoner who tried to escape by jumping from a window; 104 persons were seriously injured—16 by their own carelessness, 85 employés and three passengers who jumped from trains. This record is a slight improvement on that of last year.

RAILROAD GAZETTE

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S. WRIGHT DUNNING AND M. N. FORNEY.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subject pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

SALE OF THE NEW YORK, CHICAGO & ST. LOUIS.

On Thursday of last week the sale of a controlling interest in the stock of the new "Nickel Plate" railroad between Buffalo and Chicago was made to a syndicate represented by Gen. John H. Devereux and Judge Stevenson Burke, of Cleveland, who are, respectively, President and Vice-President of the Cleveland, Columbus, Chicago & Indianapolis Railway Company, and of the reorganized Indianapolis & St. Louis, which are lines controlled by Mr. Vanderbilt and worked as a part of the Vanderbilt system. It is natural to suppose, then, that the purchase was made in the Vanderbilt interest, and the fact that the road would be worth more to the owners of the Lake Shore than to any one else strengthens the supposition. Judge Burke is also Vice-President of the Hocking Valley Company, and it has been rumored that it was interested in the purchase, and a story is circulated that the English stockholders of the Cleveland, Columbus, Chicago & Indianapolis were the purchasers, and lately a Chicago reporter will have it that the Lehigh Valley bought the road, as, two days before the sale, he was certain that Jay Gould had bought it. It is not impossible that some other interests united in the purchase, but it remains most probable that the road is secured in the interest of the Vanderbilt lines, and will be worked in harmony with them.

It seems to us that there can be no doubt whatever that the road so worked may be made to produce better results, both for its owners and the public, than in any other way, any more than that a double-track railroad can be worked to better advantage as one than as two roads. For about 200 miles west of Buffalo the new road and the Lake Shore have stations at the same towns, and for the rest of the way to Chicago the new line is to the Air Line Division of the Lake Shore much as the latter is to its Michigan Division. Given the aggregate traffic of the two lines, there is probably no railroad manager in the country who would not say that it can be carried much more economically by working the roads by a single organization, without regard to the rates to be charged.

But further, it is likewise true that the aggregate traffic of the two roads could be carried on the double-track line of the Lake Shore. And admitting that in a few years the traffic will so grow that this double-track line will not accomodate it all, certainly if the Lake Shore were made into a three-track road it would have more capacity than that of a double-track and a single-track road combined. Now a third track would not cost, judging by the expenditures made for second tracks, as much as $10,000 per mile; and one for the Lake Shore between Chicago and Buffalo would add to its capital probably not more than $5,000,000, possibly $6,000,000. The subscriptions paid in by the syndicate which built the Nickel Plate road amounted to $20,000,000, of which, it appears, not more than $2,000,000 went for equipment (there being a separate equipment debt of $4,000,000). Thus this single track from Buffalo to Chicago appears to have cost $18,000,000—say three times as much as a third track for the Lake Shore, which would be more efficient as a carrier. Certainly the new road at cost even is a very dear third track.

It is true that the western half of the road will get some local traffic not now reached by the Lake Shore, between which and it most of the way are the lines of the Fort Wayne and the Baltimore & Ohio. But the traffic will come from country which for the most part was already within five miles or less of a railroad, and it will not be created by the new road, but will nearly all be taken from the old ones. To them the new road will be what the eastern half of it will be to the Lake Shore, except in the importance of the local traffic which may be diverted. In fact, the best use that could be made of the 150 miles of the new line between Fort Wayne and Chicago would be as a second track of the Pittsburgh, Fort Wayne & Chicago, which must very soon need one, but which can build one for less than a third of what the New York, Chicago & St. Louis cost to build, and for a fifth of what it sold for.

By the very nature of a railroad, much the cheapest way of providing for an increase of through traffic is by adding tracks to the existing lines, because a second track costs very much less than a single-track railroad, and a double-track road can do a given amount of work much more cheaply than two single-track roads. The exception is when there are great defects in the alignment of the existing road. Apparent exceptions are the very common cases where a new road is needed for local traffic, and will be chiefly supported by a traffic which existing lines do not accommodate. But this is only an apparent exception, for the new road in such a case is not built to provide for the through but for the local traffic, though it gets part of its support from the through.

The public in this country seems to have settled down to the conclusion that the most complete freedom in railroad construction is to its advantage; that if the railroads make very large profits by charging high rates, this will cause the construction of competing lines and a reduction in rates, as in nearly all other kinds of business. There is no other civilized country in the world where free railroad construction is permitted. Elsewhere a condition of obtaining a charter is to show that the proposed road will satisfy a public need, and better than can be done in any other way. Even in England, where the general freedom of railroad construction and management is much greater than elsewhere in Europe, the promoters of a new road are required to show before a parliamentary committee what public good will result from the proposed road. If it is a competing line and agrees to offer better rates or accommodations than the old roads, then, if the latter offer to do as well or better, which they can almost always afford to do rather than lose part of the business to the rival and at the same time be compelled by competition to accept its rates, permission to build the new road is rarely obtained.

Two things work against the reduction of charges by adding to the number of competing roads. One of these is the very large proportion which the interest on the capital bears to the total cost of transportation, and the other is the fact that the expense per unit of traffic is much greater when the traffic on a road is small than when it is large. Add to this the fact that by its nature a railroad usually has a vast unused capacity, and can increase its capacity at a comparatively trifling expense, and we see that the *cost* of transportation is very decidedly *increased* by the addition of a new line to do work now done by existing roads. We have, let us say, $10,000,000 invested in a railroad which carries between *A* and *B*, and earns a profit of ten per cent. by charging $2,000,000 for service that costs it $1,000,000 in working expenses. A second road is built at the same expense and the business divided equally; but neither road can do at a cost of $500,000 half of the work which one did for $1,000,000. Therefore, if rates remain the same, the profit to be divided will be something less than $1,000,000; probably not more than $800,000. Then there is $20,000,000 invested instead of $10,000,000. Thus, while the public gets no reduction in rates, the result will be a reduction from 10 to 4 per cent. on the capital invested. Ten millions of capital that might have been used in needed enterprises for the public as well as private benefit, has been so used as to increase the cost of doing a given amount of work.

All this would long ago have been as plain as day to the most casual observer but for the fact that in this country until recently, in the great majority of cases a new competing road was a great deal more than a competing road, and served local interests which fully justified its construction and made it in this way a great advantage to the community. And in most other instances, the effect of dividing the competitive traffic in advancing the cost for working expenses and partly also that for interest on capital invested has been concealed by the very rapid growth of traffic in this country and the reduction in expenses by improved methods and appliances. There have been three roads to carry the business formerly carried by two, but each has more traffic now than either of the two ever had before the third was built. This leads the superficial observer to think that the third road was needed, though likely enough even now one of the roads could easily take the traffic of all three. The cost per ton per mile is now probably much lower than when there were but two roads, but nothing is more certain than that this cost would be much less if all the traffic were carried on one line, to say nothing of the interest on the capital invested.

At the price paid for the stock, 17 for the common and 37 for the preferred, the New York, Chicago & St. Louis cost its purchasers at the rate of $12,900,000 above its funded debt of $19,000,000. They will certainly try hard to make the road earn interest on at least this $31,900,000, which is so much addition to the capital in the roads between Buffalo and Chicago. The full face of the stock is $50,000,000. It will certainly be a disadvantage to the public to pay interest on this capital in addition to that of the other roads, if it gets only the same service. It will be of no advantage to it if the profits of the old roads are reduced enough to pay interest on this. The additional line cannot decrease but must somewhat increase the total cost of carrying the traffic between Buffalo and Chicago. No one can be the gainer, that we can see, except the men who built the road for $20,000,000 and sold it for about $30,000,000, save a very few landowners in northwestern Ohio and Indiana.

The effect of the sale on the immediate prospects of railroad business is doubtless favorable. It removes a danger that threatened all through business east of the Mississippi, and makes it much more probable that rates will be maintained. The road was built and was sure to have some business. It remained to make the best use of it possible. But what will be the ultimate effect of such an end to such an enterprise? Will it not be taken as an indication that wherever there is a route with a very large and profitable traffic it will pay to build a new road; that such a line can compel the old roads to allow it a living or to buy it at an advance over cost? Why should not another company begin to-day to build another road alongside the New York, Chicago & St. Louis, or the Pennsylvania, or the Baltimore & Ohio, or the Boston & Albany? A cheap road on a route with an immense traffic can do a great damage to the existing lines, even if it does not make much profit for itself. Until very recently there have been very few instances of the working of long lines close alongside old roads. But we have had two completed this year, and another is under way, along our most important lines. The indications are that with the free railroad building secured by general railroad laws and the granting of charters practically to all who ask for them, there is likely to be a great deal more of it in the future. Certainly, the profit of ten millions or so made in building the New York, Chicago & St. Louis will greatly encourage such schemes, and under existing circumstances they perhaps are more promising in financial results to the builders than almost any other new railroad projects, whatever may be their effect on the interests of the existing railroads and the community at large.

A STANDARD FREIGHT-CAR TRUCK.

In the phraseology of trade circulars, a standard freight-car truck "is a want that has long been felt." In the earlier meetings of the Master Car-Builders' Association the "want" was expressed and the subject was discussed, and the first movement in that direction was the adoption or recommendation of a standard axle. Ever since then railroad managers and car-builders have been continuing to "feel the want," and the need of uniformity in trucks has been manifesting itself more and more urgently every year. It must be confessed, though, that the manner in which a majority of those who ought to establish, and agree in recommending, a standard truck have regarded this

question has not been very promising that the end desired would soon be reached. There is a sort of vague impression, entertained by a good many car-builders, that in order to establish a standard all that is required is to come together and count noses or votes, and that, in such cases, the largest number of votes is an arbiter having to a greater or lesser extent the attribute of infallibility, and that no matter how wrong a thing may be, whenever it secures a majority vote it becomes right. Unfortunately, the ills of life cannot be cured so easily, and unless the recommendation of the Car-Builders', or any other Association, have some much more weighty reason in their favor than the fact that they have secured a majority vote, they are not likely to be very generally adopted, or remain in use a great while. It is true that there are some things in car construction, the differences of which are of no importance, excepting that the diversity in form and proportions prevent interchangeability. In such cases it matters little which of the forms and proportions is adopted, but it is important that there should be agreement and that one and only one standard should be used. A truck, however, is not a case of this kind. It is composed of quite a considerable number of parts which must perform a variety of functions and which

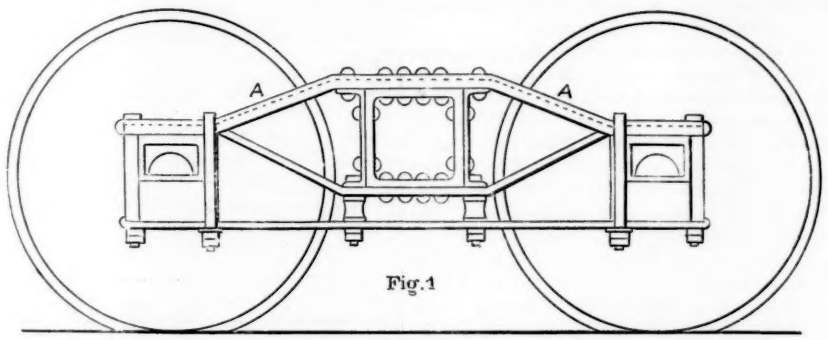

Fig. 1

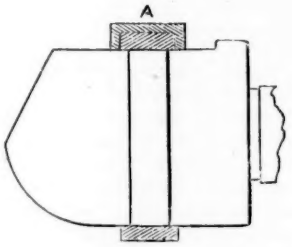

Fig. 2

Transverse Section through Journal-box.

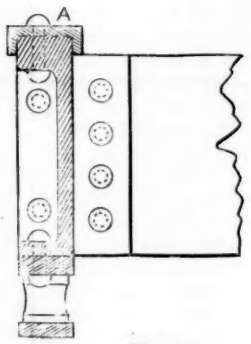

Fig. 3.

Transverse Section through centre of Truck.

are subjected to severe and complicated strains. In designing a truck it becomes a question how the most efficient structure may be made for the least money. If a given design should be recommended as a standard it would be quite certain to be abandoned as soon as its defects manifested themselves conclusively or it was shown that an equally efficient plan would cost less, or one which is no more expensive is stronger or has other advantages. It will be useless for the Car-Builders' Association to adopt a resolution recommending the Thielsen, the Cleveland, the New York Central or the Pennsylvania truck as a standard unless at the same time it is shown that the one selected has advantages over all the others.

It is, therefore, gratifying to find that the committee to which this subject was referred by the Car-Builders' Association undertook an investigation to show the weakness and the strength of different trucks in use. The report of this committee, which was made at Niagara, will be found on another page. It is true that the investigations made had a very limited range, but it is a beginning, and may act as an incentive to continue such researches. The tests made were simply to determine the capacity of the truss or "truck-side" for carrying a load resting on the bolster and supported on the journal-boxes. The experiments indicate very clearly the weak points and errors of proportion of some of the trucks in use.

As it may be thought by some that this is all merely chimerical, and an example of profane nonsense, which the mechanical fellows are so prone to indulge in, an example may be taken from the experiments reported by the committee to show the economy which might have been effected if their investigations had been made a few years earlier. The inverted arch-bar of truck-side No. 4, it will be noticed, is 1 in. thick by 3 in. wide. This failed with a load of 20 tons. In No. 6 this bar is only ⅝ in. thick, and yet the truck broke with a load of 35 tons. With less material No. 6 was 75 per cent. stronger. The difference in the weight of the two bars was about 20 pounds, or 80 pounds per car. In the original cost of the cars this, at 2½ cents per pound, would have amounted to $2 per car, to say nothing of the expense of the perpetual transportation of that amount of worse than useless weight during the whole lifetime of the car. The saving of this one item in a few thousand cars would pay for a good deal of experimenting. Other illustrations taken from the experiments could be given to show how the tests developed the weak places. Thus it was shown that the New York Central standard truck would be considerably stronger than it is if the fastening of the auxiliary arch-bar was strengthened. It happens very often in structures like bridges, car-frames and trucks, that the attachments or the fastenings which hold the parts together, and whose weakness is not suspected, break first. Thus No. 4 failed by the breaking of a rivet which held the arch-bar to the transom, which, in this case, is made of channel-iron. The New York Central truck, No. 11, failed by the breaking of a bolt which fastened the auxiliary arch-bar to the inverted arch-bar and transom. Experiments of this kind quickly reveal weak points, and when it is remembered that such defects are often duplicated by the hundreds or thousands in ordering cars, the importance of such experimental investigation becomes apparent.

It will be noticed, too, that in most of the truck frames which were tested by the committee, the top arch-bar failed by deflecting under a strain of compression. Considering the fact, that to any one with the most elementary knowledge of the nature of the strains to which a truck frame is subjected, it is apparent at a glance that this bar must resist a compressive strain, and that the weakest form into which material can be put to resist such strains is that of a flat bar, it is a little remarkable that it has not occurred to some one to make these bars of some one of the many forms into which iron is now rolled, and which are employed in the construction of bridges and for other analogous purposes. Thus if a 4×1½ in. channel bar, ½ in. thick, as shown at *A* in figs. 1, 2 and 3, were used, it would be no heavier than a rectangular bar 3×1 in., and it would have very much greater strength to resist a strain of compression than the rectangular bar. Other forms as L, T or I beams could be used with a like increase of strength.

But it must be kept in mind, that a truck frame must not only perform the service of a beam, and carry a vertical load, but it must also resist lateral shocks and diagonal strains. In passing over frogs, switches, curves, bad joints and a thousand imperfections of the track, lateral strains and concussions are transmitted by the wheels and axles to the truck frames and by them to the car body. A very important question, then, in designing or selecting a standard truck, is to learn how strong or how weak it is laterally as well as vertically. In carrying on their investigations to establish a standard truck, the committee ought to make experiments which will shed some side-light on the question. It is plain at a glance that the use of a channel or other form of "shape" bar would not only increase the vertical but also the lateral strength of the truck frame.

But there are other, and perhaps still more important, questions which should be considered in evolving a standard truck. There is a perpetual cry rising up through the land over the evil of sharp flanges and hot boxes. The exact cause which produces the former does not seem to be clearly understood. At any rate the Car-Builders' Association appointed a committee to investigate the causes of this phenomonon at their meeting in June. Mr. Sayre, of the Lehigh Valley Railroad, says that it is due to the malformation of the wheels and rails in relation to each other. He has designed a rail section and a wheel flange and tread which fit each other, and with these it is said that very few if any flanges are worn sharp. Doubtless the incongruity of form of wheels and rails is a very prolific cause, perhaps the most prolific, of worn flanges. But there are doubtless other reasons, such as the track being "out of square," or "out of line," or the king-bolt out of centre, so that one of the wheels runs toward one side of the track, and the flange thus bears continually against one of the rails. Attention has heretofore been called to the fact that no very great degree of precision in the construction of trucks is possible so long as they consist of an assemblage of rough castings and rough bars fastened together with rough bolts. The committee on this subject say in their report that a part of the deflection of the truck frames is due to the coming together of the joints which were fitted with a hammer, and were not an exact fit. In the very nature of things so long as the work is done in such a rude way there must be a great deal of inexactness in the trucks, which inevitably will be a prolific cause of sharp flanges and hot boxes. No good mechanic would, even if there were no other objections to doing it, venture to use inverted freight-car trucks as bearings for two parallel lines of heavy shafting. Yet the service of these frames in carrying the two axles of a car is many times more trying than permanent shafting could be.

It may also be remarked that since the carrying capacity of cars has been increased from 10 to 20 and 30 tons, there has not been any corresponding increase in the strength of the trucks, and that for the work they now have to do they are not proportionally as strong as the trucks were ten or fifteen years ago. Therefore if a standard is adopted now it should be one suited to the increased carrying capacity of cars of the present time. The indications all are that cars of not less than 20 tons capacity and probably considerably more will be used in future. Higher rates of speed for freight traffic also seem probable, and with these the use of continuous brakes is essential. A standard truck should therefore be designed with reference to the application of such brakes.

It is evident that if the carrying capacity of cars is increased, the cost of the trucks may be greater without any loss of economy as compared with previous practice, and that they ought to be stronger is certain. It becomes a question then whether the Master Car-Builders' standard axle is large enough for the coming standard truck and the traffic of the future. With the light of experience it is to be regretted that the present standard axle was ever adopted. At the time it was adopted a compromise was made between those in favor of a 3½ in. and those in favor of a 4 in. journal, and like most compromises, it pleased nobody. If at that time the Car-Builders' Association had adopted two standard axles, one like that used on the Pennsylvania system of roads with 3½ × 7 in. journal, and another with a 4 × 8 in. journal, it would probably have accomplished what it was aiming at better than it did.

For a number of years the standard which was adopted was used to only a very limited extent, because of the conservatism and caution of car-builders. If there had been the two standards, the conservative men would have adopted the small one much earlier than they did, and it would, no doubt, have come into much more general use by this time than has the standard which was adopted. On the other hand, the most intelligent and progressive men would have adopted the large standard, with 4+8 in. journal, and railroads would now be in a much better position to take the step demanded by the increased carrying capacity of cars.

Whatever is done regarding the axle, however, it seems certain that the standard truck we may call a

more highly organized structure than the trucks of the past have been. It must be better proportioned so as to bear a closer resemblance to the deacon's one-horse shay in being equally strong in all its parts. This means more skillful and more intelligent design and improved workmanship. Some better method of fitting truck frames than the use of a blacksmith's hammer must be used, and the system of assembling rough castings and rough bars must give place to careful and exact fitting. One important preliminary step which must be taken is the adoption of a standard wheel tread, flange and rail-head. Without these it is impossible to gauge wheels correctly.

But if the car-builders, or any other railroad officers, think that they can meet together and by adopting resolutions, without adequate preliminary investigation or study, or the exercise of a very high order of knowledge and intelligence, establish such standards, they will be wretchedly disappointed, and the standard established in that way will be unsatisfactory and an obstacle instead of a help to future progress.

SEPTEMBER EARNINGS.

For the month of September our table has reports of the earnings of no less than 76 railroads—a number wholly unprecedented—besides those of the New York Elevated roads and the mixed railroad and steamship Oregon Navigation Company. The 76 railroads worked this year 54,950 miles of road, which is about half the total now in operation in the United States, and 5,102 miles (10.2 per cent.) more than they worked last year in September. With this mileage they earned $38,715,121, which is 14 per cent. more than last year, and their average earnings per mile increased from $673 to $695, or 3¼ per cent. Of the 76 roads reporting only seven had smaller total earnings than last year, and 19 smaller earnings per mile. There are few of the enormous increases in earnings per mile that were quite common until within about a year, but there are still several large ones, as 28¼ per cent. by the Buffalo, Pittsburgh & Western, 24½ by the Cleveland, Akron & Columbus, 23 by the Hocking Valley, 33 by the Galveston, Harrisburg & San Antonio, 23¼ by the Houston, East & West Texas, 22½ by the Lake Erie & Western, 38 by the Northern Central, 105 by the Ohio Central, 35 by the Ohio Southern, 24½ by the Belleville Line, 84 by the St. Paul & Duluth, and 40 by the Manitoba. Of these the most remarkable, perhaps, is that of the Northern Central, because it is a very large increase by a road which already had very large earnings; significant also is that of the St. Paul & Duluth, which has little but through traffic to carry, and heretofore has had little of that. Its large increase indicates larger shipments by way of Duluth than have been made heretofore, and a diversion from the Lake Michigan ports. The roads with much trunk line traffic we should expect to show a large increase in earnings, because last year they were carrying through traffic at absurdly low rates, but the only ones reporting which have a very large share of this traffic are the Baltimore & Ohio, the Pennsylvania and the Northern Central, and even on the two latter the through traffic is not by any means as important as the local. The Wabash, which has much of this traffic, and also has the benefit of a great wheat crop on its lines, makes a smaller increase than we might expect if we did not know that corn is a more important freight than wheat on this road, and that the shipments are still greatly reduced by the failure of that crop last year. The Alton & Terre Haute main line has a considerable through traffic, and it makes but a small gain. The Baltimore & Ohio's increase of 7 per cent. is also less than might have been expected in view of the better rates and the good wheat crops, though the total grain movement was not so large this year as last.

Neither do the roads in the West which carry the grain from the farms, and whose rates did not suffer like those of the trunk lines last year, show an increase any way comparable to the increase in the crops. The Atchison, Topeka & Santa Fe, the chief carrier of the magnificent Kansas wheat crop, gains an eighth, it is true, but in the previous eight months it had gained a fifth; the Chicago & Alton gained at about the same rate, and this is an improvement on what it has done heretofore this year; the Hannibal & St. Joseph's increase is similar, but the Illinois Central's Illinois lines show a trifling decrease. The Missouri Pacific gains nearly 10 per cent. All these lines, it must be remembered, while they had much more wheat to carry than last year, had much less corn.

The lines further north, which carry the spring wheat, do not show by their earnings that there was a heavy movement in September, and we know that actually there was not. Besides, the crops last year north of Illinois and Iowa were not very bad last year. The crop was light, but there was no such failure as further south, and indeed this is true of Illinois also north of, say, the Rock Island road. They will not at any time have so bad a season to compare with as the more southern roads, though there are not many of the companies that do not have some road in the territory where crops were very bad. September was early enough for shipments of spring wheat from Iowa, but the gains by such roads as the Burlington, Cedar Rapids & Northern, the Central Iowa and the Iowa lines of the Illinois Central are not great, and the little Des Moines & Fort Dodge shows a decrease of one-third in total earnings, notwithstanding an increase of more than a fourth in mileage.

The lines from the north have profited all the year by the rapid growth of the country, but they hardly began to carry grain from Minnesota and Dakota in September. Returns made since show great gains for the Milwaukee & St. Paul. The St. Paul & Omaha made a large gain in September. All these lines, the Chicago & Northwestern, the Milwaukee & St. Paul, the St. Paul & Omaha, the Manitoba and the Northern Pacific, are now feeling or soon will feel the movement of the spring wheat crop, while the roads in Iowa (including some of these) will a little later be carrying new corn, and there can be no doubt that these earnings will be much greater than last year.

The Southwestern roads should have felt in September the benefit of the fine crops of Arkansas and Texas, as cotton usually begins to move pretty freely in September in Texas, and the grain crops were ripe before. They all show gains, but most of them have a large increase in mileage, and some of them have lost per mile. The San Antonio road has a very large gain, and its earnings per mile are now much greater than those of any other Texas road reporting, and perhaps as large as those of the Houston & Texas Central, which does not report.

The Southern roads east of the Mississippi have fared variously. The Mobile & Ohio has a large decrease still, and smaller earnings than before since 1878. The Louisville & Nashville shows a gain considerably greater than its increase in mileage; the Cincinnati Southern, a very small gain; the East Tennessee, a good increase; the Nashville & Chattanooga, a small loss; of five southern roads east of the Alleghanies, all have gains, but the Richmond & Danville's is small, those of the Chesapeake & Ohio and the Charlotte, Columbia & Augusta large, those of the others unimportant. All of the Southern roads should show large gains hereafter. The cotton movement was late, and that prevented a better showing in September.

The earnings in September, as a whole, were more favorable than for some time previously. As we have shown, there was then an increase of 3¼ per cent. in the average earnings per mile of the roads reporting, and September was not a bad month last year, earnings per mile then being but 1½ per cent. less than in 1880. In August, this year, there was a decrease of 1-6 per cent. in earnings per mile; in July, a decrease of 3 per cent.; in June, a decrease of 10.4 per cent.; in May, a decrease of 1 per cent.; in April, an increase of ½ per cent.; in March, an increase of 3.6 per cent.; in February, an increase of 9.2 per cent., and in January, an increase of 6.4 per cent. In the first three months of the year the increases were largely due to the comparison being with the small earnings caused by the snow blockades in these months last year.

We may thus look upon September as marking the turn in the tide from a bad crop year to a good one. Larger average increases hereafter are probable.

The largest and smallest earnings per mile this year were:

Largest:	Per mile.	*Smallest:*	Per mile.
Pennsylvania	$2,231	Little R., Miss. R. & Tex.	$147
Reading	2,031	Green B., Winona & St. P.	159
Northern Central	1,817	Toledo, Cin. & St. L.	185
Ontonagon	1,722	Houston, E. & W. Tex.	211
Eastern	1,218	Wisconsin Central	212
Baltimore & Ohio	1,164	Vicksburg & Meridian	245
Chicago & Alton	1,040	Little Rock & Ft. Smith	247
Iron Mountain	965	St. Louis & Cairo	247
Hocking Valley	907	Central Branch	254
Missouri Pacific	857	Mil., Lake Shore & West.	264
N. Y. & New England	855	Ala. Great Southern	267

Thus, one mile of the Pennsylvania earned as much as 15½ miles of the Little Rock, Mississippi River & Texas. If we had the earnings for the main line of the Pennsylvania separately, we should probably find that one mile of it earned as much as 30 miles of this or the Green Bay road. None of the roads with smallest earnings is new; but the Toledo, Cincinnati & St. Louis, the East & West Texas, the Central Branch, and the Milwaukee, Lake Shore & Western all have a good deal of new road on which the traffic is not yet fully developed, doubtless.

Below we give our usual table of earnings per mile for seven successive years:

Earnings Per Mile in September for Seven Years.

	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Ala. Great South..	.....	.....	.....	$138	$214	$242	$267
Atch.,Top. & S. F.	$381	$353	$536	561	584	692	711
Baltimore & Ohio.	.....	.....	.....	.....	1,052	1,086	1,164
Bur., Ced. Rapids & N...	247	471	320	357	365	393	396
Central Iowa	....	455	372	....	464	474	462
Central Pacific...	1,079	776	821	706	802	788	798
Charlotte, Col. & Aug.	....	....	250	280	278	233	272
Chesapeake & O.	....	....	....	515	569	568	591
Chicago & Alton.	807	709	654	749	913	922	1,040
Chic. & East. Ill.	539	437	456	579	599	686	745
Chicago & N. W.	649	839	689	779	783	793	740
Chic., Mil. & St.P.	461	835	460	467	404	433	445
Chic., St. P., Minn. & Om.	....	....	....	375	367	389	451
Cin., Ind., St. L. & Chic	683	648	673	927	812	669	675
Cleve., Akron & Col	223	246	219	256	267	279	347
Col., Hocking V. & Tol.	....	525	579	710	835	736	967
Denver & Rio Gd.	223	264	337	335	741	612	513
Des Moines & Ft. Dodge	....	....	....	280	399	506	290
Det., Lans'g & N.	....	....	....	601	509	542	612
Eastern	....	....	....	932	1,084	1,147	1,218
E. Tenn., Va. & Ga	348	....	344	....	314	329	352
Flint & Pere Marquette..	....	....	....	383	459	488	526
Gulf, Col. & S. F.	....	....	....	....	321	462	497
Hannibal & St. Jo	634	699	791	605	799	736	819
Houston, E. & W. Tex	....	....	....	....	127	171	211
Ill. Cen. in Ill	693	825	606	682	685	704	701
Ill. Cen. in Iowa..	318	521	336	382	443	454	459
Ind., Bloom. & W	353	356	555	577	455	447	393
Int. & Great Nor.	290	264	302	340	371	445	453
Kan. C., Ft. Scott & G	....	....	...	....	341	464	445
Lake Erie & West	....	....	....	291	303	322	394
Louisv. & Nashv.	535	537	420	477	506	517	547
Marq., H. & Ontonagon	....	....	....	....	1,183	1,531	1,722
Mo., Kan. & Tex.	367	346	375	427	424	548	503
Mobile & Ohio...	332	269	181	319	364	416	303
Missouri Pacific..	...	....	....	....	584	781	857
Nash., Chat. & St. L.	389	451	354	347	369	517	486
N. Y. & New Eng	....	....	....	....	857	841	855
Norfolk & West..	415	433	353	414	489	517	543
Northern Central.	1,209	1,159	1,098	1,309	1,424	1,318	1,817
Northern Pacific.	....	....	....	421	458	550	608
Pennsylvania	2,309	1,688	1,600	1,782	1,940	1,940	2,231
Peoria, Dec. & Ev.	....	....	....	....	225	283	254
Phila. & Reading.	1,535	1,666	843	1,558	2,470	1,954	2,031
Richmond & Dan.	306	348	340	404	439	432	440
St. L., A. & T. H., Main Line	....	....	....	586	701	667	692
St. L., A. & T. H., Belleville Line.	628	706	855	778	559	549	684
St. Louis & Cairo.	172	146	135	197	262	239	247
St. L. & San Fran.	415	412	351	443	470	433	510
St. L., Iron Mt. & So	520	612	599	863	980	1,034	965
St. P. & Duluth..	....	428	311	368	311	372	685
St. P., Min. & Man.	....	....	....	501	418	561	786
Scioto Valley	....	176	292	281	317	412	425
South Carolina...	413	319	444	463	579	476	499
Texas & Pacific..	394	448	405	541	523	393	447
Tol., Cin. & St. L.	....	....	....	....	99	156	185
Union Pacific....	....	....	....	....	732	824	788
Wab., St. L. & P.	....	....	....	....	565	488	491
West Jersey	635	450	399	436	....	631	648

No less than 31 of the 59 roads above had larger earnings per mile this year in September than in any previous year here reported.

For the nine months ending with September our table has reports from 66 railroads, whose aggregate length this year is 51,736 miles, which includes about 45 per cent. of the total in operation in the United States, and 5,632 miles, or 12¼ per cent., more than the same companies worked last year. With this mileage they earned this year $274,639,038, which is 13 per cent. more than their earnings last year, and their average earnings per mile *increased* from $5,273 to $5,308, or ¾ per cent.—a trifling change, but favorable because of the large amount of new road this year; though against that we may cite the fact that there was also a large mileage of new road last year.

Of the 66 roads reporting, only nine had smaller total earnings this year than last, but 23 had smaller earnings per mile. The most important of these decreases in earnings per mile are 23 per cent. on the Denver & Rio Grande (with a large increase of mileage), 18 per cent. on the Des Moines & Fort Dodge, 31 per cent. on the Central Branch (some new road and very poor crops), and 22 on the Mobile & Ohio (poor crops). The very large increases are 27 per cent. by the Buffalo, Pittsburgh & Western, 41 per cent. by the Chicago & Grand Trunk, 23 per cent. by the Hocking Valley, 48½ per cent. by the Houston, East & West Texas (which still has very light earnings, however), 36 by the Marquette, Houghton & Ontonagon (whose increase in earnings per mile is larger than that of any other road), 33 by the Milwaukee, Lake Shore & Western, 22½ by the Northern Pacific (making them larger than those of most Western roads), 63½ by the Ohio Central, 46½ by the St. Paul & Duluth, 53¾ by the Manitoba, and 32 per cent. by the Wisconsin Central—great gains to have been made in a bad crop year, and evidence of the rapid growth to the country which these lines serve.

September Earnings and Expenses of the Pennsylvania Railroad.

The report for the lines of the Pensylvania Railroad Company east of Pittsburgh and Erie shows in the month of September a continuance of the great increase in earnings which made August a remarkable month in the history of the road. The increase in September was not quite so great as in August, and the increase of expenses was much greater than then, so that the increase in net earnings was but

$271,249 in September, against $388,356 in August; but the former sum is still a very considerable one; and it is not, as might be supposed, an increase over very small earnings last year, but over an amount that was exceeded in but four months of the year.

The increase in gross earnings in September was $682,596, or 19 per cent.; there was an increase of $411,347 (18 per cent.) in working expenses; leaving in net earnings an increase of $271,249, or 18½ per cent. For ten successive years the gross and net earnings and working expenses of these lines in the month of September have been:

Pennsylvania Railroad Earnings and Expenses in September.

Year.	Gross Earnings.	Expenses.	Net Earnings.
1873	$4,039,196	$2,195,096	$1,844,100
1874	3,252,228	2,039,810	1,212,418
1875	3,571,057	1,897,504	1,673,553
1876	3,869,994	1,649,320	2,220,674
1877	3,006,408	1,471,691	1,534,717
1878	2,858,646	1,456,451	1,402,195
1879	3,336,529	1,745,891	1,590,638
1880	3,647,543	2,172,634	1,474,909
1881	3,735,006	2,271,829	1,463,177
1882	4,417,602	2,683,176	1,734,426

The gross earnings, it will be seen, in spite of the railroad war, were larger in 1881 than in 1880. The increase in them since 1879 is nearly one-third, since 1878 it is 54 per cent. It will be noticed that the September earnings were very large as far back as 1873—the panic month. This, however, was the only month in which the earnings of the road ever reached $4,000,000 down to October, 1876, and after that month these earnings were not reached again until May of this year. The earnings were $253,577 less in September this year than in August, but both in 1880 and 1881 earnings were also larger in August. This would be unusual on the trunk lines further north, but the Pennsylvania and the Baltimore & Ohio not infrequently have a heavy wheat traffic in August, before the traffic fairly begins further north.

The working expenses in September, however, were larger than in August even, and have been exceeded in but two months in the history of the road—in May and June, 1873. The increase since 1880 is 23¼ per cent.; since 1879, 54 per cent., and since 1878, 84 per cent. Great as has been the increase of traffic since 1878, it has not been nearly so great as this, and evidently the cost of transportation per unit of traffic has materially increased on this road. Still, the net earnings in September were among the largest in the history of the road. They were exceeded slightly last May, and largely (by $298,438) in August, and also slightly in March of last year, but never before except in the three heaviest months of Centennial travel and in September, 1873.

The lines west of Pittsburgh and Erie in September realized a profit of $437,029 over the accruing interest and rentals, against $214,113 last year, $206,982 in 1880 and $345,688 in 1879, and against $293,612 in August of this year, and $506,252 in the whole year down to September. Down to July this system showed a loss, and the profit in August and September is a favorable indication for future months. The increased September profit on these lines added to the increase in the net earnings of the Eastern system makes a total gain of $462,941, which is more than ½ per cent. on the stock outstanding.

For the nine months ending with September, the gross and net earnings and working expenses of the Pennsylvania's lines east of Pittsburgh and Erie have been, for six successive years:

Pennsylvania Railroad Earnings and Expenses for Nine Months.

Year.	Gross earnings.	Expenses.	Net earnings.
1877	$22,006,256	$14,098,741	$7,917,515
1878	22,819,918	13,534,111	9,285,807
1879	24,516,214	14,824,106	9,692,108
1880	30,253,617	17,827,312	12,426,305
1881	32,878,246	19,482,436	13,395,810
1882	35,887,786	22,283,280	13,604,506

This year there is an increase of $3,009,540, or 9⅛ per cent., in gross earnings, of $2,800,844, or 12½ per cent., in expenses, and of the trifling amount of $208,696, or 1½ per cent., in net earnings. Until September, in spite of a large increase in gross earnings, there was a decrease in net earnings. For the first four months of the year this decrease amounted to $931,000; there has been an increase every month since, which by the end of August had nearly offset this decrease. Compared with years previous to last year, the gross earnings were this year 18½ per cent. more than in 1880, 46 per cent. more than in 1879, and 57 per cent. more than in 1878. Nothing that has been published is better evidence of the enormous growth of the business of the country since 1878 than this tremendous growth in the earnings of this great railroad system, but a mere trifle of which is due to increase of mileage. Doubtless it has prospered much more than the average, because its lines serve the leading iron and coke industries, which have grown much more than most other industries in this time.

The increase in working expenses is 66 per cent. since 1878, and 25 per cent. since 1880, and has been so great that with an increase of 57 per cent. over 1878 in gross earnings, in net earnings the increase is but 46 per cent. and since 1880 the increase is but 9½ per cent. in net against 18½ per cent. in gross earnings. If the increase in net earnings had been in proportion to that in gross since 1880, the profits would have been $1,130,000 greater this year.

The lines *west* of Pittsburgh and Erie in the nine months ending with September earned a profit of $943,281 over interest and rentals this year, against $2,268,783 last year, $2,086,231 in 1880, and $108,834 in 1879. The decrease from last year is thus still $1,325,502, and after allowing for the profit on the Eastern system, the Pennsylvania Railroad Company's profits were $1,116,808 less than last year at the end of September, which is about 1⅜ per cent. on the stock. At the end of June this decrease in profits was $2,502,041—more than twice as great. Thus if, the gain in the last quarter of the year is as great as in the previous quarter, the company's profits from its two systems will be rather more than last year. And there is a very good prospect still that this will be the case, especially as last year there was a greater loss in the last quarter than before. If there were a freer movement of crops, there would probably be a considerable gain over last year, but that is now quite uncertain. As soon as corn is fit to ship we may expect a very active movement in that grain, there not being enough to supply the demand now; and it will be in shipping order on the lines of this road and the Baltimore & Ohio earlier than on the other trunk lines. This possibly may gain it an important December grain business, even if the wheat should continue to come forward slowly.

We call attention to the fact that an error in the report sent by the Associated Press made the decrease in the earnings of the lines west of Pittsburgh and Erie only $1,325, instead of $1,325,502. Those who study the reports closely doubtless were not misled by it; but to most readers it must have conveyed a very erroneous impression.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Indiana, Illinois & Iowa.—Extended from Momence, Ill., east 5 miles.

Jacksonville, St. Augustine & Halifax.—Track laid from the St. Johns River, opposite Jacksonville, Fla., south by east 6 miles. Gauge, 3 ft.

Northern Pacific.—Extended from Park City, Mon., west to Merrill, 23 miles. The *Fergus Falls Branch* is extended from Fergus Falls, Minn., west to Breckenridge, 27 miles.

Union Pacific.—Track on the *Oregon Short Line* is extended westward to Portneuf, Idaho, 55 miles; also from American Falls westward 16 miles.

This is a total of 132 miles of new railroad, making 8,446 miles thus far this year, against 5,763 miles reported at the corresponding time in 1881, 4,614 miles in 1880, 2,859 miles in 1879, 1,724 miles in 1878, 1,824 miles in 1877, 1,913 miles in 1876, 1,080 miles in 1875, 1,524 miles in 1874, 3,130 miles in 1873, and 6,106 miles in 1872.

THE NEW YORK OCEAN STEAMER RATES doubtless put a limit on rates by sail and from other points, but the latter do not by any means preserve uniform differences from the New York rates. For instance, last Friday contracts were made for carrying grain by steam from New York to Liverpool at 3¾d. per bushel, and the same day, in New York, from Baltimore to Liverpool a rate of 6d. was made; and contracts were made for a sailing vessel to carry thence to Cork for orders now at 5s. per quarter (=7½d. per bushel), and from New York at the same time for 4s.4½d. (=6½d.) Thus the Liverpool steamer rate was 60 per cent., and the Cork sail rate only 12½ per cent. higher from Baltimore than from New York. At the same time steamers were chartered to carry from Baltimore to Cork for orders next January at 5s. 3d. per quarter (=7⅞d. per bushel).

It must be remembered that a vessel chartered to Cork for orders carries the grain to whatever British port ordered on arrival at Cork, and the rates for this carriage, even by sail, are almost always much higher than those to Liverpool, because there is always a surplus of grain room to Liverpool, and most of what goes there by steamer must be transferred and re-shipped thence by rail or vessel to the points where consumed, at a cost often greater than that for carriage from New York; while the vessels chartered to Cork for orders deliver the grain at or near to the point of consumption. They usually carry nothing but grain, while the Liverpool steamers get their chief income from other freight which pays better rates—cotton, provisions, flour, etc. The miscellaneous cargoes are carried almost exclusively by the regular lines of steamers; and there are some of these which deliver at London, Glasgow and Bristol as well as the lines to Liverpool. Grain rates are almost always higher to these latter ports than to Liverpool, though the difference to Glasgow is sometimes small. Last Friday, for instance, when grain was taken from New York to Liverpool at 3¾d. per bushel, to other ports the rates made were: Glasgow, 4d. and 4¼d.; Bristol, 7d.; London, 7¼d.; Hull, 5¼d.; Antwerp, 6⅛d.; Amsterdam, 7⅛d.

A little reflection will show that these rates are likely to vary greatly. The steamer of a regular line will make a very low rate, if necessary, to get grain to fill out its cargo before its sailing day; and we saw last spring that for some time Boston steamers, instead of charging freight on grain, paid for it as ballast. This extreme very seldom happens, but it often happens that a vessel with a full miscellaneous cargo is compelled to make a rate much less than would be a paying rate for a full cargo to get grain to fill before its sailing day. This gives a very decided advantage to those ports which have many steamer lines, or heavy miscellaneous exports of any kind that do not take up all the grain room. The chief advantage is with New York, the port with the chief miscellaneous exports, the largest imports, and consequently the most steamer lines; next comes Boston, which, however, does not export much grain; and the whole grain export business of New Orleans may be said to be due to the fact that the chief exports of cotton are made thence, and that the vessels (sail or steamer) can take a good deal of grain with a full cargo of cotton.

CHICAGO RAIL SHIPMENTS EASTWARD for the week ending Oct. 21 have been for three years:

	1880.	1881.	1882.
Tons	44,530	56,304	33,580

Thus this year they were 40 per cent. less than last year, and 25 per cent. less than in 1880. At this time in 1880 the Chicago shipments increased rapidly, but at this time last year they began to fall off. In 1881 the average weekly shipments were 35,183 tons in September, 38,560 in the first two weeks of October, and 48,124 in the following six weeks till the close of navigation. In 1881 the average was 61,120 tons a week in September, 59,043 in October and only 50,293 in November. The movement in 1880 was the more natural one, the rail shipments increasing as the close of navigation approaches.

The receipts from the week's shipments must have been about at the rate of $1,000 this year to every $674 last year and every $1,616 in 1880. The ruling rate during the week last year is said to have been 10 cents per 100 lbs.

For seven successive weeks the shipments this year have been, in tons:

Week to						
Sept. 7.	Sept. 14.	Sept. 21.	Sept. 30.	Oct. 7.	Oct. 14.	Oct. 21.
38,106	36,878	35,611	35,076	32,810	34,790	33,580

For the last four weeks, therefore, the shipments have fluctuated very little.

Of the shipments of the week ending Oct. 21, the Chicago & Grand Trunk carried 12.5 per cent., the Michigan Central 23.6, the Lake Shore 19.2, the Fort Wayne 18.9, the Pan-Handle 18.5 and the Baltimore & Ohio 7.3 per cent. The feature of the week is a great falling-off from the Fort Wayne and a nearly corresponding gain by the Pan-Handle, which very seldom has carried so large a proportion of the Chicago shipments. There has been a blockade on the Fort Wayne, we believe, which has compelled a temporary reduction of shipments over it. The two Pennsylvania roads together still had 37.4 per cent. of the total; the two Vanderbilt roads, 42.8 per cent.

For the week ending Oct. 28 the shipments billed at Chicago (not including those from points West billed through Chicago, which are included in the above statement) were 26,027 tons this year, against 46,647 tons in the corresponding week of last year, and 23,060 in the previous week of this year. There was a great increase in Western grain *receipts* during this week, and if these keep on large it may be expected that the shipments will continue to increase. One week more and those who ship grain by lake and canal can hardly expect it to get through this season.

The decrease from last year's shipments was one-third in provisions, nearly one-half in grain and 34 per cent. in flour.

While, compared with last year, there was a decrease of 3,322 tons of flour shipped by rail, there was an increase of 3,546 tons in the quantity shipped by lake; but there was a decrease of 7,863 tons in the grain shipped by lake, as well as a decrease of 13,771 tons in the rail shipments.

IMMIGRATION falls off slightly. For the month of September and the three months of the fiscal year then ending the Bureau of Statistics reports the arrivals to have been:

	1882.	1881.	Decrease.	P.c.
September	49,935	58,454	8,519	14.6
Three months	158,021	171,805	13,784	8 0

Notwithstanding the decrease the arrivals are enormous, never approached before except in 1880 and 1881. They continue to be considerable since September, but will doubtless fall off in the winter, to begin again in the spring more or less heavy, according to the prospects then, here and in Europe, but sure to be large. A continuance of immigration is now of great importance to many railroads, as on it largely depends whether there will be a paying traffic for the great mileage of new roads.

LAKE RATES have further advanced ¼ cent, to 3 cents per bushel for corn and 3¼ for wheat from Chicago to Buffalo, and some charters were made at ¼ cent more than this.

Canal rates are unchanged at 4⅝ cents per bushel for oats, 6 for corn and 6½ for wheat from Buffalo to New York, rail rates remaining as they have been since February, 5 cents for oats, 8½ for corn, and 9 for wheat.

There is substantially no change in ocean rates. The rate for grain by steam from New York to Liverpool may be quoted at 4d. per bushel.

Railway Building and its Methods.

The most striking, and perhaps the most important, fact in the business situation of the United States at the present moment is unquestionably the extraordinary extent to which railway building has been carried and is now going on. Ever since the country began to recover from the disastrous revulsion of 1873 nothing has proved so attractive to the possessors of the savings accumulated through the long period of economy which followed that revulsion as railroad ventures. Not only has a great amount of railroad building been carried on on new lines, but old lines have been extended, new combinations have been formed, involving considerable improvements, road-beds have been remodeled and regraded, new rails have replaced old ones, expensive and elaborate stations, freight-houses and elevators have been erected, rolling stock has been increased or changed, and in numerous channels capital has been absorbed, credit has been used and labor employed. Had this restless activity proceeded upon a solid basis and in accordance with sound business principles, there would still have been a conversion of available into fixed capital which would have been attended with some danger. But the process has not been confined to these limits. By the various devices of which the "construction company" is a type the enterprises thus begun or extended have been loaded down with fixed charges out of all proportion to the capital actually invested in them, while the evidences of indebtedness created have been made the instruments of reckless and often of unscrupulous speculation. The inevitable result is that the exchanges of the country have been flooded with "securities" that are far from secure, and a very considerable proportion of the capital which would otherwise have been at the service of ordinary business has been diverted toward the treacherous and greedy quicksands of stock gambling.

That there must come a reaction from this method of car-

rying on a portion of the business of the country so great and so important is plain. The reaction has, indeed, already set in. Many of the securities based not on actual investment, but on hopes of future profit rashly and heavily discounted, have already lost much of the price which was created for them by the over-confidence of the public. And not only are most of these bound to shrink still more, but others must shrink badly which have yet hardly begun to do so. This is obvious from the fact that the enormous rate of profit held out by the "construction company" mode of doing business has induced a great deal of work to be undertaken of which there was no real need, and for which there was no legitimate opening. The money was subscribed, not for the profits to be had from transporting freight and passengers, but for the profits to be got by selling at a great advance securities distributed at very low rates. The amount of work undertaken and the way in which it was performed were, therefore, not regulated by the requirements of probable traffic, but by the demand for the inflated securities. The enterprises frequently ceased to be enterprises in any normal sense, and became mere speculative and gambling ventures. As in every such procedure, the most eager and least calculating motives of the average moneyed man were appealed to, and the ventures were necessarily greatly overdone.

Were the unfortunate consequences of this mistaken method confined to those who enter upon it from pure speculation, the public could regard it with equanimity, if not with indifference. But this is not the case. The consequences are widespread. Capital is turned from safer channels, labor is unduly employed and its relations with capital are disturbed. Credit is extravagantly extended, and the secure and orderly operations of financial institutions are interrupted, perverted and exposed to serious embarrassments. When the reaction comes the difficulties to which it gives rise are extensive and embrace all classes of the community. Labor suffers even more in proportion than commerce or capital. Enforced and ruinous idleness follows high wages, and prices which have been inflated by the flood of partly fictitious values shrink slowly, while habits of easy expenditure survive the means to indulge in them. All the elements of depression and of possible collapse and panic are produced, and it is only a question of time when they will do their work.—*New York Times.*

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Baltimore & Ohio, annual meeting, at the office in Baltimore, Nov. 20, at 10 a. m.. Transfer books close Nov. 9.

Texas & Pacific, adjourned meeting of stockholders, in Marshall, Tex., Dec. 5, at noon.

Dividends.

Dividends have been declared as follows:

Atchison, Topeka & Santa Fe, 1½ per cent., quarterly, payable Nov. 15.

Boston & Maine, 4 per cent., semi-annual, payable Nov. 15, to stockholders of record Oct. 26.

Boston & Providence, 4 per cent., semi-annual, payable Nov. 1, to stockholders of record Oct. 23.

Cedar Rapids & Missouri River (leased to Chicago & Northwestern), 1½ per cent., quarterly, on common stock, payable Nov. 1.

Concord, 5 per cent., semi-annual, payable Nov. 1.

Manchester & Lawrence, 5 per cent., semi-annual, payable Nov. 1.

Nashua & Lowell (leased to Boston & Lowell), 4 per cent., semi-annual, payable Nov. 1.

New York, Providence & Boston, 2 per cent., quarterly, payable Nov. 10. Transfer books closed Nov. 1.

Hanover Junction, Hanover & Gettysburg, 2 per cent., semi-annual, payable, Nov. 6.

Pennsylvania, 4½ per cent., semi-annual, payable Nov. 29, 2½ per cent. in cash and 2 per cent. in scrip convertible into stock. Transfer books closed Oct. 31.

Pullman's Palace Car Co., 2 per cent., quarterly, payable Nov. 13.

Mail Service Extensions.

Mail service has been ordered over new railroad lines as follows:

Lehigh & Hudson River, service ordered between Greycourt, N. Y., and Belvidere, N. J., 63 miles, beginning Oct. 30.

Order of Railway Conductors.

The annual meeting of the Grand Lodge was held in St. Paul, Minn., Oct. 19. There was a full attendance, and the reports presented showed the Order to be in a prosperous condition. The usual routine business was transacted, and it was decided to hold the next meeting in Kansas City.

Brotherhood of Locomotive Engineers.

The annual convention of the Brotherhood, which began in Louisville, Ky., Oct. 18, closed Oct. 25. The business meetings were held with closed doors, as usual, but it is understood that business of much importance to the Brotherhood was transacted.

The following extracts from the address of Grand Chief Engineer P. M. Arthur describe the present condition of the Brotherhood:

"The fiscal year just closed has been one of unparalleled growth and prosperity to our society. The business upon the roads, with the exception of about two months, has been brisk, so that good engineers have had no difficulty in procuring employment at fair wages. No railroad officer who is disposed to deal justly and honestly with his men will object to their joining an organization whose sole aim is to educate them to a higher standard of excellence in their profession, and to provide for the widows and orphans of deceased members. During the fiscal year 32 new divisions were established, making 195 in all, while there has also been a larger increase in the membership of the old divisions.

"It is also a source of gratification that we are still enabled to report an increase in the membership of the Insurance Association, notwithstanding the number of deaths and forfeitures were greater this year than the previous one. We had at the close of the last fiscal year, Sept. 30, 1881, 2,654; died during the year, 43; forfeited, 229; and had on Sept. 30, 1882, 2,888, showing a net gain of 234. We have paid 42 claims varying in amount from $2,505 to $2,708, amounting in the aggregate to $110,057.58, at an average cost of 1½ per cent. premium to the policy holder."

Southern Railway and Steamship Association.

The annual convention of this Association began in Atlanta, Ga., Oct. 25. Senator Joseph E. Brown, President, presided. The following officers were present: Joseph E. Brown, President; Virgil Powers, General Commissioner; C. A. Sindall, Secretary; M. S. Freeman, General Agent clearing house; E. T. Huger, General Agent; T. H. Carter, Board of Arbitration. The various roads were represented as follows: Western & Atlantic, Joseph E. Brown, President, R. A. Anderson, Superintendent, J. M. Brown, General Freight Agent; Rome Railroad, E. Hillyer, President; Nashville, Chattanooga & St. Louis, J. W. Thomas, Superintendent, G. F. Knox, General Agent, Wallace McPherson, General Southern Agent; Louisville & Nashville, M. H. Smith, Vice-President, J. M. Culp, General Freight Agent, T. Welch, Assistant General Freight Agent; Atlanta & West Point, A. J. Orme, General Freight Agent; Central Railroad & Banking Company of Georgia, E. P. Alexander, President, W. G. Raoul, Vice-President and General Manager, G. A. Whitehead, General Freight Agent, D. W. Appler, General Western Agent; Griffin & Carrollton, R. L. McCoughey, President; South Carolina Railroad, S. B. Pickens, General Freight Agent; Georgia Railroad, J. W. Green, General Manager, E. R. Dorsey, General Freight Agent; Richmond & Danville, T. M. R. Talcott, Vice-President and General Manager, Sol. Haas, Traffic Manager, J. H. Drake, Acting General Freight Agent, G. S. Barnum, Assistant General Freight Agent; Merchants' & Manufacturers' Transportation Co., J. B. West, Agent; East Tennessee, Virginia & Georgia, H. Fink, General Manager, W. V. McCracken, Superintendent, J. R. Ogden, General Freight Agent, Ray Knight, Assistant General Freight Agent, J. J Griffin, Assistant General Freight Agent; Port Royal & Augusta, W. G. Raoul, President, J. S. Davant, General Freight Agent; Charlotte, Columbia & Augusta A. C. Haskell, President, D. Cardwell, Assistant General Freight Agent; Wilmington & Weldon, Wilmington, Columbia & Augusta and Seaboard Air Line, Sol. Haas, Traffic Manager; Cincinnati Southern, E. P. Wilson, General Freight Agent, W. S. St. George, General Agent; Alabama Great Southern, M. Colbran, General Freight Agent; Augusta & Knoxville, E. S. Verdery, President, G. P. Hill, General Freight Agent. There were also other railroad men present.

After the Association was called to order the General Commissioner's report was read, and a committee, consisting of all the general freight agents, was appointed to consider the division of business at competitive points. The Association then adjourned until the following day.

At the second day's session but little business of importance was done. The matter of the revision of the rules and the division of business, etc., was referred to the general managers, who are expected to report at the next meeting. The Rate Committee made a few changes but none of consequence. The changes were left in the hands of Mr. Sindall, the Secretary, who will have the revised rate sheet prepared.

The Association adjourned to meet in December, on a day yet to be selected by the President. At that meeting much business of importance is to be transacted, and the election of officers of the Association will take place.

ELECTIONS AND APPOINTMENTS.

American Refrigerator Transit Co.—Mr. Reid Northrop has been appointed General Superintendent, in place of D. M. Higgs.

Binghamton & Williamsport.—The officers of this new company are: President, Rodney A. Ford, Binghamton, N. Y.; directors, John Bradshaw, John M. Heacock, D. T. Huckle, R. A. Ford, Cyrus Strong, W. G. Weed, Charles Davis, Erastus Ross, John Evans, Binghamton, N. Y.; R. H. Woolley, Danville, Pa.; R. J. C. Walker, D. M. Peck, E. R. Payne, Fletcher Coleman, Williamsport, Pa.; Chief Engineer, John Evans.

Boston & Albany.—It it announced that on Dec. 1 Mr. Walter H. Barnes will be made General Superintendent, with office in Boston, in place of Charles O. Russell, resigned. Mr. E. Gallup (now General Passenger Agent) will succeed Mr. Barnes as Assistant General Superintendent, with office in Springfield, and will also retain general charge of the passenger business.

Boston, Winthrop & Point Shirly.—At the annual meeting in Boston, Oct. 31, the following directors were chosen: Clarence A. Parks, Wakefield, Mass; John H. Buttrick, Lowell, Mass.; Francis French, Samuel W. Hale, Keene, N. H.; Nelson K. Baker, Alpheus P. Blake, David Loring, Boston.

Brotherhood of Locomotive Engineers.—At the annual meeting in Louisville last week the following officers were chosen: Second Grand Engineer, F. Payette, Quebec; Second Assistant Grand Engineer, H. E. Mills, Clinton, Ia.; Third Assistant Grand Engineer, C. B. Gifford, Louisville, Ky. The other officers hold over.

Chicago & Atlantic.—Mr. Russell Elliott is appointed Auditor, with office in Chicago. Mr. Elliott was for many years on the Indianapolis & St. Louis road.

RAILROAD EARNINGS IN SEPTEMBER.

Name of Road.	Mileage. 1882.	1881.	Inc.	Dec	P.c.	Earnings. 1882.	1881.	Increase.	Decrease.	P. c.	Earnings Per Mile. 1882.	1881.	Inc.	Dec.	P. c.
						$	$	$	$		$	$	$	$	
Ala. Gt. Southern	290	290	.....	.....	.....	77,793	70,326	7,467	.....	10.6	267	242	25	.....	10.6
Atchison, Top. & S. F.	1,832	1,670	162	.....	9.7	1,302,535	1,155,869	146,666	.....	12.7	711	692	19	.....	2.7
Baltimore & Ohio*	1,512	1,512	.....	.....	.....	1,759,291	1,642,634	116,657	.....	7.1	1,164	1,086	78	.....	7.1
Buffalo, Pitts. & West	223	205	18	.....	8.8	91,763	65,362	26,401	.....	40.6	411	319	92	.....	28.7
Bur., Ced. Rap. & No.	660	564	96	.....	17.0	261,439	221,801	39,638	.....	17.8	396	393	3	.....	0.7
Central Iowa	244	210	34	.....	16.1	112,824	99,640	13,184	.....	13.2	462	474	.....	12	2.5
Central Pacific	3,100	2,775	325	.....	11.8	2,474,000	2,185,303	288,697	.....	13.1	798	788	10	.....	1.3
Char., Col. & Aug.	238	238	.....	.....	.....	64,819	55,373	9,437	.....	17.1	272	233	39	.....	17.1
Ches. & Ohio	517	435	82	.....	18.9	305,365	247,143	58,222	.....	23.3	591	568	23	.....	4.0
Chicago & Alton	847	840	7	.....	0.8	881,109	774,790	106,319	.....	13.8	1,040	922	118	.....	12.9
Chi. & Eastern Ill.	232	220	12	.....	5.5	172,777	150,915	21,862	.....	14.5	745	686	59	.....	8.6
Chi., Mil. & St. Paul.	4,380	3,800	580	.....	15.3	1,950,000	1,644,670	305,330	.....	18.5	449	434	12	.....	2.8
Chi. & Northwestern.	3,375	2,890	485	.....	16.8	2,497,053	2,292,677	204,376	.....	8.9	740	793	.....	53	6.7
Chi., St. P., M. & O.	1,070	960	110	.....	11.5	482,997	373,370	109,627	.....	29.5	451	389	62	.....	16.0
Cin., Ind., St. L. & Chi.	384	342	42	.....	12.3	259,379	228,653	30,726	.....	13.4	675	669	6	.....	0.9
Cin., N. O. & T. Pac.	336	336	.....	.....	.....	243,252	239,981	3,271	.....	1.4	724	714	10	.....	1.4
Cleve., Akron & Col.	144	144	.....	.....	.....	50,006	40,213	9,793	.....	24.4	347	279	68	.....	24.4
Col., Hock'g V. & Tol.	320	320	.....	.....	.....	290,357	235,663	54,694	.....	22.9	907	736	171	.....	22.9
Denver & R. G.	1,160	963	197	.....	20.5	595,306	589,287	6,019	.....	1.0	513	612	.....	99	16.3
Des M. & Ft. Dodge	108	84	24	.....	28.6	31,353	47,519	.....	16,166	34.0	290	566	.....	276	48.8
Det., Lan. & Nor.	226	226	.....	.....	.....	138,203	122,419	15,784	.....	13.0	612	542	70	.....	13.0
Eastern*	284	282	2	.....	0.7	345,900	323,553	22,347	.....	7.0	1,218	1,147	71	.....	6.2
E. Tenn., Va. & Ga.*	900	900	.....	.....	.....	317,130	296,240	20,890	.....	7.0	352	329	23	.....	7.0
Evansv. & T. H.*	157	144	13	.....	9.0	75 345	70,080	5,265	.....	7.5	480	487	.....	7	1.4
Flint & Pere Mar.	345	318	27	.....	8.5	181,343	155,255	26,088	.....	17.2	526	488	38	.....	7.8
Gal., Har. & San A.*	270	256	14	.....	5.5	190,581	135,972	54,609	.....	40.2	706	531	175	.....	33.1
G'n B., Win. & St. P.*	220	220	.....	.....	.....	34,881	34,786	95	.....	0.3	159	158	1	.....	0.3
Gulf, Col. & S. F.	392	260	132	.....	50.8	194,653	120,196	74,457	.....	62.0	497	462	35	.....	7.5
Hannibal & St. Jo.	292	292	.....	.....	.....	239,196	215,103	24,093	.....	11.2	819	736	83	.....	11.2
Houston, E. & W. Tex.	104	88	16	.....	18.2	22,141	15,078	7,063	.....	47.1	211	171	40	.....	23.5
Ill. Cen., Ill. lines	918	918	.....	.....	.....	643,494	646,411	.....	2,917	0.4	701	704	.....	3	0.4
Iowa lines	402	402	.....	.....	.....	184,744	182,437	2,307	.....	1.2	459	454	5	.....	1.2
Ind., Bloom. & West.	695	555	140	.....	25.2	273,100	247,932	25,168	.....	10.1	393	447	.....	54	12.1
Kan. City, F. Scott & G.	360	320	40	.....	12.5	160,282	148,421	11,861	.....	8.0	445	464	.....	19	4.1
Lake Erie & Western.	386	386	.....	.....	.....	152,196	124,280	27,916	.....	22.5	394	322	72	.....	22.5
Little Rock & Ft. S.*	168	168	.....	.....	.....	41,522	44,348	.....	2,826	6.4	247	264	.....	17	6.4
Little R., Miss. R. & T.*	173	156	17	.....	10.9	25,400	23,600	1,800	.....	7.6	147	151	.....	4	2.7
Long Island	335	335	.....	.....	.....	241,034	213,621	27,413	.....	12.3	719	638	81	.....	12.3
Louisville & Nash.	2,025	1,840	185	.....	10.1	1,107,985	951,566	156,419	.....	16.4	547	517	30	.....	5.8
Louisv., N. A. & Chi.*	380	290	90	.....	31.0	143,800	98,000	45,800	.....	46.7	378	338	40	.....	11.8
Marietta & Cin.*	312	312	.....	.....	.....	201,929	177,566	24,363	.....	13.7	647	569	78	.....	13.7
Mar., Hought. & Ont.	88	88	.....	.....	.....	151,502	134,743	16,759	.....	12.4	1,722	1,531	191	.....	12.4
Mil., L. S. & West.	296	250	46	.....	18.4	83,012	65,013	17,999	.....	27.7	280	260	.....	20	7.7
Mo. Pacific lines:															
Central Branch	387	300	87	.....	29.0	100,248	84,298	15,950	.....	18.9	254	281	.....	27	9.6
Int. & Gt. Northern.	775	623	152	.....	24.4	350,835	277,296	73,539	.....	26.6	453	445	8	.....	1.8
Mo., Kan. & Tex.	1,230	1,003	227	.....	22.5	618,701	549,332	69,369	.....	12.6	503	548	.....	45	8.2
Mo. Pacific	935	800	135	.....	16.9	801,416	625,133	176,283	.....	28.6	857	781	76	.....	9.7
St. L., I. M. & So.	750	685	65	.....	9.5	724,160	708,325	15 835	.....	2.2	965	1,034	.....	69	6.7
Texas & Pacific	1,054	880	174	.....	19.8	470,613	345,790	124,823	.....	35.8	447	393	54	.....	13.8
Mobile & Ohio	528	506	22	.....	4.3	160,031	210,262	.....	50,231	23.9	303	416	.....	113	27.2
Nash., Chat. & St. L.†	348	348	.....	.....	.....	168,999	179,978	.....	10,979	6.1	486	517	.....	31	6.1
N. Y. & N. England.	396	356	40	.....	11.2	338,490	299,573	38,917	.....	13.0	855	841	14	.....	1.7
Norfolk & Western.	428	428	.....	.....	.....	232,774	221,438	11,336	.....	5.1	543	517	26	.....	5.1
Northern Central.	326	326	.....	.....	.....	592,435	429,565	162,870	.....	37.9	1,817	1,318	499	.....	37.9
Northern Pacific.	1,298	972	326	.....	33.5	789,700	534,363	255,337	.....	47.8	608	550	58	.....	10.5
Ohio Central	232	232	.....	.....	.....	119,377	58,383	60,994	.....	105.0	515	252	263	.....	105.0
Ohio Southern*	138	128	10	.....	7.8	38,511	26,634	11,877	.....	44.0	279	208	71	.....	35.0
Pennsylvania‡	1,980	1,925	55	.....	2.8	4,417,603	3,735,007	682,596	.....	18.3	2,231	1,940	291	.....	15.1
Peo., Dec. & Evansv.	254	248	6	.....	2.4	65,524	70,222	.....	4,698	6.7	254	283	.....	29	10.3
Phila. & Reading	994	994	.....	.....	.....	2,019,017	1,945,874	73,143	.....	3.8	2,031	1,954	77	.....	3.8
Rich. & Danville	757	757	.....	.....	.....	333,000	327,000	6,000	.....	1.8	440	432	8	.....	1.8
St. L., A. & T. H., M. Li'e	195	195	.....	.....	.....	134,880	129,984	4,896	.....	3.4	692	667	25	.....	3.4
Belleville Line	121	121	.....	.....	.....	82,779	66,384	16,395	.....	24.5	684	549	135	.....	24.5
St. Louis & Cairo	146	146	.....	.....	.....	36,040	34,883	1,157	.....	3.3	247	239	8	.....	3.3
St. Louis & San Fran.	690	645	15	.....	2.4	336,804	279,064	57,740	.....	20.6	510	433	77	.....	17.8
St. Paul & Duluth	175	175	.....	.....	.....	119,802	65,095	54,707	.....	84.1	685	372	313	.....	84.1
Scioto Valley	128	128	.....	.....	.....	54,357	52,640	1,717	.....	3.2	425	412	13	.....	3.2
South Carolina	243	243	.....	.....	.....	121,380	115,700	5,660	.....	4.9	499	476	23	.....	4.9
Tol., Cin. & St. L.	500	435	65	.....	14.9	92,610	67,666	24,944	.....	43.3	185	156	29	.....	18.6
Union Pacific	3,740	3,450	290	.....	8.4	2,949,112	2,844,357	104,755	.....	3.7	788	824	.....	36	4.3
Vicks. & Meridian*	142	142	.....	.....	.....	34,805	43,300	.....	8,495	19.6	245	305	.....	60	19.6
Va. Midland	352	352	.....	.....	.....	155,123	144,270	10,853	.....	7.5	441	410	31	.....	7.5
Wab., St. L. & Pacific.	3,425	3,080	345	.....	11.2	1,682,382	1,490,028	192,354	.....	12.8	491	488	3	.....	0.7
West Jersey	163	163	.....	.....	.....	105,583	102,931	2,652	.....	2.6	648	631	17	.....	2.6
Wisconsin Central	390	390	.....	.....	.....	82,492	73,186	9,306	.....	12.7	212	188	24	.....	12.7
Total, 76 roads	54,950	49,846	5,104	.....	.....	38,715,121	33,531,506	4,779,927	96,312	.....	695	673	22	.....	.....
Total inc. or dec	.....	.....	5,104	.....	10.2	.....	.....	4,683,615	.....	14.0	.....	.....	22	.....	3.3

SUPPLEMENTARY TABLE.

Met. Elevated	18	18	.....	.....	.....	198,681	218,977	.....	20,296	9.2	11,068	12,165	.....	1,127	9.2
N. Y. Elevated	14	14	.....	.....	.....	280,008	225,321	54,687	.....	24.3	20,001	16,094	3,907	.....	24.3
Oregon Ry & Nav. Co.§	2,103	1,931	172	.....	89	550,000	464,812	85,188	.....	18.3	262	241	21	.....	8.7
Phila. & Read. Coal & Iron Co.	.....	.....	.....	.....	.....	1,460,315	1,410,537	58,778	.....	4.2	.....	.....	.....	.....	.....

* Not in the table of earnings for the nine months.
† Does not include branch or leased lines.
‡ Includes all lines east of Pittsburgh and Erie.
§ Railroad, 528 miles; steamboat and steamship lines, 1,575 miles.

RAILROAD EARNINGS, NINE MONTHS ENDING SEPTEMBER 30.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1882.	1881.	Inc.	Dec	P. c.	1882.	1881.	Increase.	Dec.	P. c.	1882.	1881.	Inc.	Dec.	P. c.
						$	$	$	$		$	$	$	$	
Ala. Gt. Southern	290	290	.....	....	.....	575,174	535,343	31,831	.....	5.9	1,983	1,874	109	....	5.9
Atchison, Top. & S. F.	1,811	1,626	185	....	11.5	10,412,198	8,559,348	1,852,850	.....	21.5	5,749	5,264	485	....	9.2
Buffalo, Pitts. & West.	213	205	8	....	3.9	649,065	491,176	157,889	.....	32.3	3,047	2,396	651	....	27.1
Bur., Cedar Rap. & No.	624	564	60	....	10.7	1,976,033	1,602,296	373,737	....	23.3	2,167	2,841	326	....	11.4
Central Iowa	244	192	52	....	27.4	848,132	679,876	168,256	.....	24.7	3,476	3,541	....	65	1.8
Central Pacific	2,963	2,647	316	....	12.2	19,983,619	17,063,092	1,920,527	.....	11.3	6,407	6,446	....	39	0.6
Char., Col. & Aug.	238	238	.....	....	.....	601,624	636,920	.....	25,296	4.0	3,528	2,634	.....	106	4.0
Ches. & Ohio	484	435	49	....	11.3	2,402,425	2,031,220	371,205	.....	18.3	4,964	4,669	295	....	6.3
Chi. & Alton	847	840	7	....	0.8	5,818,484	5,466,704	351,780	.....	6.4	6,870	6,508	362	....	5.6
Chi. & Eastern Ill.	232	220	12	....	5.5	1,305,653	1,493,008	112,645	.....	8.5	5,628	5,423	205	....	3.8
Chi. & Gd. Trunk*	335	335	.....	.....	.....	1,541,234	1,091,548	449,686	.....	41.0	4,601	3,258	343	....	41.0
Chi., Mil. & St. Paul.	4,258	3,797	461	....	12.1	14,100,000	12,010,538	2,089,462	.....	17.4	3,311	3,163	148	....	4.7
Chi. & Northwestern.	3,299	2,815	484	....	17.3	17,272,007	15,633,596	1,638,411	.....	10.5	5,236	5,554	....	318	5.8
Chi., St. P., Minn. & O.	1,042	952	90	....	9.5	3,494,194	2,817,396	676,798	.....	24.0	3,353	2,950	394	....	13.2
Cin., Ind., St. L. & Chi.	370	329	41	....	12.4	1,919,953	1,755,177	164,776	.....	9.4	5,189	5,335	....	146	2.7
Cin., N. O. & Tex. Pac	336	336	.....	.....	.....	1,851,226	1,662,127	189,099	.....	11.4	5,510	4,947	563	....	11.4
Cleve., Akron & Col	144	144	.....	.....	.....	367,610	309,729	57,881	.....	18.7	2,553	2,151	402	....	18.7
Col., Hock'g Vy. & Tol.	320	320	.....	.....	.....	2,094,101	1,699,048	395,053	.....	23.2	6,534	5,310	1234	....	23.2
Denver & Rio Grande	1,080	728	352	....	48.2	4,772,034	4,168,273	603,761	.....	14.5	4,419	5,726	....	1307	22.9
Des M. & Ft. Dodge	89	84	5	....	6.0	255,161	294,921	.....	39,760	13.5	2,867	3,510	....	643	18.1
Det. Lan. & No.	226	226	.....	....	.....	1,172,774	1,002,622	170,152	.....	17.0	5,189	4,436	753	....	17.0
Flint & Pere Marq.	345	318	27	....	8.5	1,546,505	1,352,809	192,696	.....	14.2	4,483	4,257	226	....	5.3
Grand Trunk†	2,322	2,213	109	....	4.9	12,932,687	11,881,840	150,847	.....	1 3	5,182	5,369	..	181	3.5
Gulf, Col. & S. F.	348	229	119	....	51.7	915,364	661,273	254,091	.....	38.5	2,688	2,888	..	200	6.9
Hannibal & St. Jo.	292	292	..	....	....	1,579,206	1,635,375	.....	56,169	3.4	5,408	5,573	....	165	3.4
Houston, E. & W. Tex.	104	86	18	....	20.9	191,289	106,538	84,751	.....	79.2	1,839	1,239	600	....	48.4
Ill. Cent., Ill. lines	918	918	.....	....	.....	5,135,141	4,932,140	203,001	.....	4.1	5,594	5,373	221	....	4.1
Iowa lines	402	402	..	....	....	1,367,703	1,338,327	29,376	.....	2.2	3,402	3,329	73	....	2.2
Ind., Bloom. & West.	602	555	47	....	8.5	1,910,421	1,865,819	44,602	.....	2.4	3,173	3,362	....	181	5.4
Kan. City, Ft. St. & G.	340	308	32	....	10.4	1,224,464	1,100,618	123,846	.....	11.2	3,601	3,573	29	....	0.8
Lake Erie & Western.	386	386	.....	....	.....	1,085,557	1,041,492	44,065	.....	4.2	2,807	2,697	110	....	4.2
Long Island	335	323	12	....	3.8	1,773,845	1,533,196	240,649	.....	15.7	5,295	4,747	548	....	11.5
Louisville & Nashv.	2,025	1,840	185	....	10.1	9,323,034	8,122,410	1,200,624	.....	14.8	4,604	4,414	490	....	4.3
Mar., Hought. & Ont.	88	88	.....	....	.....	974,615	716,732	258,883	.....	36.1	11,087	8,145	2942	....	36.1
Mil., Lake Sh. & West.	284	250	34	....	13.6	647,625	427,011	218,624	.....	50.9	2,280	1,716	564	....	33.0
Mo. Pacific lines:															
Central Branch.	382	300	82	....	27.3	633,910	722,947	.....	89,037	12.2	1,659	2,410	....	751	31.2
Int. & Gt. No.	775	623	152	....	24.4	2,158,934	1,879,620	288,314	.....	15.2	2,786	3,003	....	217	7.2
Mo., Kan. & Tex.	1,217	915	302	....	33.5	4,373,785	3,843,296	530,489	.....	13.5	3,594	4,200	....	606	14.3
Mo. Pacific	890	756	134	....	17.7	5,659,741	4,866,440	773,301	.....	15.7	6,359	6,464	....	105	1.7
St. L., Iron Mt. & So.	738	685	53	....	7.7	5,146,963	5,221,653	.....	74,690	1.4	4,174	7,623	..	649	8.5
Texas & Pacific	996	787	209	....	26.1	3,340,570	2,787,630	552,940	.....	19.8	3,423	3,542	....	119	3.4
Mobile & Ohio	528	506	22	....	4.3	1,324,599	1,624,598	.....	299,899	18.4	2,509	3,210	....	701	21.9
Nash., Chatta. & St. L.	348	348	.....	....	.....	1,385,040	1,577,951	.....	192,911	12.2	3,980	4,534	....	554	12.2
N. Y. & New England.	396	325	71	....	23.0	2,540,785	2,067,915	472,870	.....	22.5	6,416	6,363	53	....	0.8
Norfolk & Western.	428	428	..	....	....	1,671,429	1,586,065	85,364	.....	5.4	3,905	3,706	199	....	5.4
Northern Central.	326	326	.....	....	.....	4,421,277	4,030,253	391,024	.....	9.7	13,562	12,363	1199	....	9.7
Northern Pacific.	1,140	763	377	....	49.6	4,870,460	2,660,942	2,209,581	.....	83.1	4,272	3,487	785	....	22.4
Ohio Central	232	232	.....	....	.....	745,130	458,414	286,716	.....	63.5	3,212	1,976	1236	....	63.5
Pennsylvania§	1,940	1,897	43	....	2.3	35,888,784	32,879,244	3,009,518	.....	9.2	18,499	17,332	1167	....	6.9
Peoria, Dec. & Evans.	254	229	25	....	10.9	586,502	504,630	81,872	.....	16.2	2,309	2,204	105	....	4.8
Phila. & Reading	994	994	.....	..	.....	15 552,965	14,919,675	633,290	.....	4.3	15,647	15,010	637	....	4.3
Rich. & Danville	757	757	.....	....	.....	2,536,060	2,451,893	84,167	.....	3.4	3,350	3,239	111	....	3.4
St. L., Alt. & T. H., Main Line	195	195	.....	....	.....	986,904	1,090,665	.....	103,761	9.5	5,061	5,593	....	532	9.5
Belleville Line	121	121	.....	....	.....	626,210	544,902	81,308	.....	14.9	5,175	4,503	672	....	14.9
St. L. & Cairo	146	146	.....	....	.....	272,756	309,494	.....	36,738	11.9	1,868	2,120	....	252	11.9
St. L. & San Francisco.	660	603	57	....	9.5	2,550,904	2,279,441	271,463	.....	11.9	3,865	3,780	85	....	2.2
St. P. & Duluth	175	175	.....	....	.....	740,518	505,111	235,407	.....	46.6	4,232	2,886	1346	....	46.6
St. P., Minn. & Manitoba	960	781	179	....	23.0	6,118,864	3,236,459	2,882,405	.....	89.0	6,374	4,144	2230	....	53 8
Scioto Valley	128	114	14	....	12.3	393,332	390,962	83,370	.....	26.9	3,073	2,719	354	....	13.1
South Carolina	243	243	.....	.....	.....	847,967	845,623	2,344	.....	0.3	3,489	3,479	10	....	0.3
Tol., Cin. & St. L.	440	352	88	....	25 0	658,982	466,894	192,088	.....	41.0	1,498	1,326	172	....	13.1
Union Pacific	3,727	3,419	308	....	9.0	21,111,219	18,973,016	2,138,203	.....	11.3	5,664	5,549	115	....	2.0
Va. Midland	352	352	.....	.....	.....	1,018,009	948,885	69,124	.....	7.3	2,892	2,696	196	....	7.3
Wab., St. L. & Pac.	3,358	2,567	791	....	30.5	12,285,011	10,391,883	1,893,128	.....	18 2	3,658	4,048	....	390	9.6
West Jersey	163	143	20	....	14.0	884,485	789,876	94,609	.....	12.0	5,426	5,524	....	98	1.8
Wisconsin Central	491	491	.....	....	.....	1,185,706	898,668	287,128	.....	32.0	2,415	1,830	585	....	32.0
Total, 66 roads	51,736	46,104	5,632	....	.....	274,639,038	243,105,483	32,451,816	918,261	.....	5,308	5,273	35	.....	.....
Total inc. or dec.	.....	.....	5,632	....	12.2	.....	.....	31,533,555	.....	13.0	.....	.....	35	.....	0.7

SUPPLEMENTARY TABLE.

Metropolitan Elevated.	18	18	.....	....	.....	2,049,445	1,843,000	206,445	.....	11.2	113,858	102,389	11,469	....	11.2
N. Y. Elevated	14	14	.....	.....	.....	2,419,668	2,144,813	274,855	.....	12.8	172,833	153,201	19,632	....	12.8
Oregon Ry. & Nav. Co‡	1,997	1,870	127	....	6.8	3,706,600	3,101,879	604,721	.....	19.5	1,856	1 659	197	....	11.9
Phila. & Read. Coal & Iron Co.	.....	.....	.....	....	.....	10,779,247	9,791,689	987,558	.....	10.1	.....	.....	.....	....	....

* Not in table of earnings for September.
† Not in September table; includes former Great Western road.
‡ Does not include branch or leased lines.
§ Includes all lines east of Pittsburgh and Erie
‖ Railroad, 422 miles; steamboat and steamship lines, 1,575 miles.

Chicago, Burlington & Kansas City.—Mr. Robert Law is appointed General Superintendent. He was recently on the Union Pacific.

Chicago, Indiana & Ohio River.—The directors of this new company are: Wm. Darroch, James DeWolf, Wm. Foster, Andrew Hall, Joseph Law, G. W. McCray, John Peacock.

Chicago & Northwestern.—Mr. S. H. Brown is appointed Road-Master of the Galena & Madison Division. He was formerly a conductor on the road.

Cincinnati, Wabash & Michigan.—At the annual meeting last week the following directors were chosen: Norman Beckley, W. Bingham, C. E. Cowgill, J. A. Defrees, F. M. Gray, W. S. Jones, C. P. Leland, R. E. Mix, Henry B. Payne, Jephtha H. Wade, H. W. Williams. The board re-elected Jephtha H. Wade President: W. Bingham, Vice-President; Norman Beckley, General Manager; W. S. Jones, Secretary and Treasurer.

Illinois Central.—Mr. Henry Schlacks has been appointed Acting Superintendent of Machinery in place of S. J. Hayes, deceased. Mr. A. W. Sullivan is appointed Acting Assistant Superintendent of Machinery. Mr. Wm. Renshaw is appointed Acting Master Mechanic of the Chicago Division in place of Mr. Schlacks.

Illinois & St. Louis.—Mr. W. O. Hewitt has been appointed Master Mechanic, with headquarters in Belleville, Ill., dating from Sept. 13. Mr. Hewitt was for a long time Master Mechanic of the Toledo, Peoria & Warsaw, now the Peoria Division of the Wabash line.

Mexican Interoceanic.—Mr. Alfred F. Sears is appointed General Manager, with headquarters at Tehuantepec, Mexico. He was recently on the Mexican Central.

New England Association of General Passenger & Ticket Agents.—At the annual meeting in Boston, Oct. 25, the following officers were chosen: President, A. C. Kendall, New York & New England; Vice-President, J. F. Liscomb, Portland Steam Packet Co.; Secretary, C. A. Waite, Worcester & Nashua.

Ohio & Mississippi.—Mr. J. H. Setchel is appointed General Master Mechanic, and all division master mechanics will report to him. Mr. Setchel was for many years on the Little Miami road and recently on the Kentucky Central. He is a prominent member of the Master Mechanics' Association, and its Secretary for many years.

Order of Railway Conductors.—At the meeting of the Grand Lodge in St. Paul, Minn., Oct. 19, the following officers were elected for the ensuing year: C. S. Wheaton, Elmira, N. Y., Grand Chief Conductor; J. N. Robinson, Milwaukee, Assistant Chief Conductor; W. P. Daniels, Cedar Rapids, Grand Secretary and Treasurer; H. S. Defries, Toronto, Ont., G. S. C.; Levi Greer, Denver, G. I. C.; George J. Johnson, G. I. S.; S. E. Farnham, G. O. S.; J. S. Randolph, E. O. Soule, Executive Committee.

Peoria, Decatur & Evansville.—Mr. Samuel M. Miller has been appointed General Passenger Agent. He was recently on the Gulf, Colorado & Santa Fe road.

St. Louis, Ft. Scott & Wichita.—Mr. F. H. Dowland is appointed Auditor in place of A. Popkess, who has been appointed Treasurer to succeed W. Chenault, resigned.

St. Louis, Keokuk & Northwestern.—Mr. Robert Law is appointed General Superintendent. He was recently on the Union Pacific.

St. Louis & San Francisco.—Mr. W. L. Coyne is appointed Superintendent of Telegraph of all lines operated by this company, with headquarters at Springfield, Mo., vice W. D. Littlefield, resigned.

Skowhegan & Athens.—Mr. A. S. C. Hall, of East Madison, Me., is President of this company. Mr. Frederick Danforth is Chief Engineer.

South Pennsylvania.—It is reported that Mr. Robert H. Sayre is to be President of this company, which is engaged in building a line from Harrisburg, Pa., westward to the Connelisville coke region. Mr. Sayre has just resigned his position as Superintendent and Engineer of the Lehigh Valley road.

Southwestern, of Georgia.—The board has elected John E. Jones President, in place of W. S. Holt, deceased, and has chosen W. G. Raoul and J. J. Gresham directors, in place of Mr. Jones, chosen President, and Wm. M. Wadley, deceased. The road is leased to the Central, of Georgia.

Texas Continental Transportation Co.—Mr. D. M. Higgs has been chosen President and General Manager.

Toledo & Milwaukee.—The directors of this new company are: James E. Neale, Hamilton, O.; Samuel Thomas, Columbus, O.; C. S. Brice, Lima, O.; J. A. Latcha, Cleveland, O.; C. R. Cummings, Chicago.

Union Pacific.—Mr. Edward Dickinson is appointed General Superintendent of the Western Division, including all lines west of Cheyenne, in place of Mr. Robert Law, who has gone to the Chicago, Burlington & Kansas City road. Mr. Dickinson was recently Superintendent of the Laramie Division.

Mr. W. B. Doddridge is appointed General Superintendent of the Idaho Division, a new division including the Utah & Northern and the Oregon Short Line. He was recently Superintendent of the Utah & Northern.

Western Maryland.—The board has re-elected John M. Hood President and General Manager; Alexander Rieman, Vice-President; John D. Harden, Secretary and Treasurer.

PERSONAL.

—Mr. T. W. Kennan, Superintendent of the Western Division of the New York & New England road, has resigned his position.

—Mr. C. O. Russell, General Superintendent of the Boston & Albany road, has resigned his position on account of ill health, and will retire Dec. 1 next.

—Mr. Alfred F. Sears has resigned his position as Assistant General Manager of the Mexican Central road to take charge of the Mexican Interoceanic line.

—Mr. Albert Netter has resigned his position as Vice-President of the Cincinnati Northern Company, in consequence of a disagreement with the majority of the board.

—Mr. A. P. Prout has resigned his position as Road-Master of the New York, Woodhaven & Rockaway road, to accept a position with the Lelance & Grosjean Manufacturing Co. as salesman for the spike-extractor, of which he is the patentee.

—Mr. Joseph A. Seeds, who was severely burned by an accident to his engine on the New York Division of the Pennsylvania Railroad last week, and whose case has attracted a great deal of attention, died Oct. 26 in the hospital in Jersey City, and was buried at Bordentown Oct. 29, a large number of the employés of the road being present.

—Mr. Charles A. Whitney, President of Morgan's Louisiana & Texas and of the Houston & Texas Central Company, died suddenly in New York, Oct. 29, while on his way to Europe. He was 57 years old. Mr. Whitney was a son-in-law of the late Charles Morgan, and since that gentleman's death has had charge of all his large railroad and steamship interests in Louisiana and Texas. Before that time he was for some years Mr. Morgan's chief lieutenant.

—Mr. George Haven, who died in Framingham, Mass., Oct. 11, aged 74 years, was for many years an active railroad man. He began as a station agent on the Boston & Worcester road, and was afterwards Superintendent of the Old Colony road, which he left to take charge of a road in Indiana. He afterwards returned to the Old Colony as Superintendent, and went from that road to the Syracuse, Binghamton & New York, of which he had charge until he finally retired from active life.

—There are granted yearly by the French government prizes to the authors of the best papers contributed by members of the Corps of Bridges and Highways to their monthly *Annales*. The prizes for 1880 have recently been awarded: a gold medal of the value of 600 francs to MM. Picard, and Bruniguel, engineers in chief of the Corps for the "Memoir on the Exhaussement du Mouillage of the Canal from the Marne to the Rhine." And the Minister of Public Works has ordered that in this case the prize shall be doubled and that each of the persons who co-operated with the authors of the prize paper in giving material for it, should receive a medal of the value of 60 francs.

A gold medal worth 300 francs, is awarded to M. Baum, ordinary engineer of the Corps for his "Study of the Virtual Length of a Railroad Location," and a similar medal to M. Brosselin, engineer in chief, for his "Note on the Construction of the Sully Bridges."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1881-82.	1880-81	Inc. or Dec.		P. c.
Year ending Sept. 30:					
Boston & Albany	$7,790,373	$7,875,285	D.	$84,912	1.1
Net earnings	2,189,382	2,186 873	I.	2,509	0.1
Connecticut River	868,013	812,006	I.	56,007	6.9
Net earnings	252,418	221,895	I.	30,523	13.7
Nine months ending Sept. 30:	1882.	1881.			
Norfolk & Western	$1,671,429	$1,586,065	I.	$85,364	5.1
Net earnings	724,991	740,139	D.	15,148	2.0
Pennsylvania	35,888,784	32,879,244	I.	3,009,540	9.2
Net earnings	13,604.506	13,395,810	I.	208.696	1.2
West Jersey	884,485	789,876	I.	94.609	11.9
Net earnings	400,801	354,926	I.	45,875	12.9
Month of August:					
St. John & Maine	$11,930	$13,625	D.	$1,695	12.5
Net earnings	2,271	3,004	D.	733	24.4
Month of September:					
Central, of Georgia	$320,200	$351,585	D.	$31,385	8.9
Net earnings	169,663	147,725	I.	21,938	14.8
Norfolk & Western	232,774	221,438	I.	11,336	5.1
Net earnings	120,168	123,908	D.	3,740	3.0
Pennsylvania	4,417,603	3,735,007	I.	682,596	18.3
Net earnings	1,734,425	1,463,176	I.	271,249	18.5
West Jersey	105,583	102,931	I.	2,652	2.6
Net earnings	35,603	46,077	D.	10,474	22.8
Third week in October:					
Chi. & Alton	$195,235	$184,104	I.	$11,131	6.0
Chi. & Eastern Ill.	46,349	37,749	I.	8,600	22.6
Chi. & Gd. Trk	52,640	39,693	I.	12,947	32.4
Chi., Mil. & St. P.	519,000	349,495	I.	169,505	48.4
Hann. & St. Jo.	54,824	54,558	I.	266	0.5
Mo. Pacific lines	736,807	597,823	I.	138,984	23.2
Northern Pacific	196,600	131,861	I.	64,739	49.0
Wab., St. L. & P.	416,000	328,000	I.	88,000	26.8

Grain Movement.

For the week ending Oct. 21 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past nine years:

Year.	Northwestern receipts.	—Northwestern shipments.— Total.	By rail.	P. c. by rail.	Atlantic receipts.
1874	2,805,468	3,405,068	321,261	9.4	3,496,749
1875	5,345,597	2,589,240	1,213,492	46.9	3,765,419
1876	4,495,985	3,910,976	1,359,160	34.8	4,010,230
1877	3,708,064	3,215,675	661,309	20.6	6,374,990
1878	4,417,060	3,498,848	891,528	25.5	5,637,089
1879	7,564,000	4,283,729	1,387,767	32.4	7,571,864
1880	8,666,749	5,639,945	1,874,401	33.2	7,605,300
1881	4,004,019	4,747,161	2,146 046	45.2	3,330 864
1882	4,502,201	3,273,210	1,640,898	50.1	3,892,298

The receipts of the Northwestern markets for the week were this year 558,000 bushels (14 per cent) more than last year, but less than in 1880, 1879, and also 1875. They were nearly 7 per cent. less than in the previous week of this year, and were the smallest, with one exception, since the middle of July. The shipments of these markets were the smallest for nine years, with the exception of 1875 and 1877. Compared with previous weeks of this year they were 880,000 bushels (21 per cent.) less than the previous week, and, like the receipts, the smallest since the middle of July. The shipments by rail were more than half of the

total, which is a larger proportion than in any corresponding week. The earnings from these shipments must have been about at the rate of $1,000 this for every $651 last, $1,371 in 1880 and $1,184 in 1879. Besides the rail shipments 99,766 bushels (3.1 per cent. of the whole) went down the Mississippi. This left the lake shipments unusually light—only in two weeks last year were they so small while navigation was open, and this year they have been less only in three weeks of May and the first two weeks of July.

The Atlantic receipts were 562,500 bushels (17 per cent.) more than last year, but with that exception are smaller than in any corresponding week since 1876; they were 529,000 bushels more than in the previous week of this year, but with that exception were the smallest since July.

Of the Northwestern receipts for the week, Chicago had 38 per cent.; St. Louis, 20.4; Toledo, 11; Milwaukee, 10.6; Peoria, 8.9; Detroit, 8.8, and Cleveland, 2.3 per cent.; no receipts are reported at Duluth. Compared with the previous week there is a large decrease at Toledo and a large increase at St. Louis and Peoria, both having the largest receipts since August.

Of the Atlantic receipts New York had 64.4 per cent., Baltimore 10.1, New Orleans 9.1, Boston 6.8, Montreal 5.6, Philadelphia 3.8, and Portland 0.2 per cent. Compared with the previous week there is a considerable gain at New York and New Orleans. The Philadelphia receipts are nearly twice as great as the week before, but still very small, and the Baltimore receipts, which were so large in August and September, remain small, as in the earlier weeks of October.

Of the exports of this week ending Oct. 21, 49.5 per cent. was from New York, 14.6 from Baltimore, 12.3 from New Orleans, 11.7 from Montreal, 6.7 from Philadelphia, and 5.2 from Boston.

For the week ending Oct. 25 the Atlantic exports were 1,797,270 bushels of grain and 137,533 barrels of flour this year, against 2,761,643 bushels and 58,590 barrels in 1881, and 5,302,054 bushels and 75,575 barrels in 1880.

For the week ending Oct. 28 receipts and shipments at Chicago and Milwaukee were:

	1882.	1881.	1882.	1881.
Chicago	2,909,801	2,369,242	1,758,485	2,551,062
Milwaukee	565,245	316,454	258,846	153,500
Both	3,475,046	2,685,696	2,017,331	2,704,562

There is thus an *increase* of 790,000 bushels in receipts and a *decrease* of 687,000 in shipments. The Milwaukee receipts are exceptionally large.

Buffalo receipts and shipments in the same week ending Oct. 28 were:

	1882.	1881.	1882.	1881.
By rail	331,700	618,200	526,700	715,200
By water	1,595,000	1,623,000	966,400	1,016,000
Total	1,926,700	2,241,200	1,493,100	1,731,200

The rail receipts have fallen off 45 per cent., the lake receipts very little; the rail shipments are reduced 26 per cent., the canal shipments 5 per cent. The latter are exceptionally light.

For this week ending Oct. 28 receipts at four Eastern ports have been for three years:

Bushels:	New York.	Boston.	Phila.	Baltimore.	Total.
1882	2,375,021	276,233	139,050	494,244	3,284,548
1881	1,868,547	433,329	229,700	468,662	3,000,238
1880	4,503,971	409,450	1,200,100	1,569,910	7,783,431
P. c. of total:					
1882	72.3	8.4	4.2	15.1	100.0
1881	62.3	14.4	7.7	15.6	100.0
1880	59.1	5.3	15.4	20.2	100.0

Philadelphia and Baltimore together had 19.3 per cent. of the total receipts this year, against 23.3 last year and 35.6 in 1880.

Of the New York receipts 947,867 bushels (40 per cent.) arrived by rail this year, against 1,070,753 bushels (59.7 per cent.) in 1881 and 1,530,846 bushels (33.3 per cent.) in 1880. The receipts in 1880 were among the largest on record.

Philadelphia continues to have very small receipts—about half as much as its average consumption. Baltimore shows some gain over the two weeks next previous.

Receipts of wheat, corn and oats at Indianapolis, Peoria, Chicago, Milwaukee, Detroit and Cleveland weekly since July have been:

	Receipts.			Shipments.		
Week to	Wheat.	Corn.	Oats.	Wheat.	Corn.	Oats.
Aug. 7	1,784,228	1,004,752	318,235	2,248,733	955,051	442,577
Aug. 14	9 6,261	1,087,493	535,630	1,332,419	935,102	492,523
Aug. 21	1,188,833	1,370,026	1,372,098	1,207,303	1,185,078	843,174
Aug. 28	1,893,983	1,583,283	1,908,715	1,243,804	1,246,792	1,644,622
Sept. 4	2,424,120	1,649,956	1,991,790	1,822,105	1,361,477	1,573,383
Sept. 11	2,245,314	1,437,744	1,168,715	1,904,307	701,007	1,463,396
Sept. 18	2,128,277	1,279,105	896,459	1,797,394	1,233,769	966,963
Sept. 25	2,129,194	1,550,142	638,750	1,799, 87	820,394	949,944
Oct. 2	2,594,197	1,207,431	782,466	1,502,891	925,461	692,639
Oct. 9	1,758,063	582,385	689,941	1,530,929	999,929	762,673
Oct. 16	1,613,142	585,693	598,745	1,442,867	1,010,135	698,246
Oct. 23	1,551,546	799,054	907,759	1,115,129	812,236	944,775
Oct. 30	1,880,266	1,666,023	1,148,491	1,033,308	909,114	725,612

This shows a great increase in receipts last week. The wheat receipts are the largest since September, the corn receipts the largest in the time covered by the table, and were twice as great as in any earlier week of the month, and the oats receipts the largest for seven weeks. In shipments there was not much change.

Buffalo grain receipts up to Oct. 31 were as follows, flour in barrels and grain in bushels:

	Flour.		Grain.	
	1882.	1881.	1882.	1881.
By lake	1,585,299	851,538	42,641,606	51,773,450
By rail	550,385	760,800	20,361,200	27,509,900
Total	2,135,684	1,612,338	63,002,806	79,283,350
P. c. by rail	26.2	47.2	32.3	34.7

Increase in flour, 523,346 barrels, or 32.5 per cent.; decrease in grain, 16,280,544 bushels, or 20.5 per cent. The notable point is the increase of flour, especially by lake.

For the same period shipments eastward of grain received by lake were as follows, in bushels:

	1882.	1881.	Decrease.	P.c.
By canal	26,703,632	28,302,872	1,599,240	5.3
By rail	10,033,365	19,788,860	9,755,495	49.3
Total	36,736,997	48,091,732	11,354,735	23.6
P.c. by rail	27.3	41.1	13.8	....

The decrease was chiefly in rail shipments. The canal opened April 11 in 1882, and May 17 in 1881.

Up to Oct. 31 this year, 5,921 boats cleared from Buffalo on the Erie Canal and the tolls received were $298,189, against 5,677 boats cleared and $296,515 tolls received up to the same date last year.

Coal Movement.

Coal tonnages for the week ending Oct. 21 are reported as follows:

	1882.	1881.	Inc. or Dec.	P.c.
Anthracite	693,889	600,640	I. 93,249	15.5
Semi-bituminous	121,014	105,347	I. 15,667	14.9
Bituminous, Penna	70,842	59,721	I. 11,121	18.5
Coke, Penna	49,559	42,474	I. 7,085	16.8

Anthracite markets are still quiet and the domestic demand is lighter than usual at this season, owing to the continuance of warm weather. No change was made in the companies' price lists on Nov. 1.

The bituminous market is active, with full demand and a somewhat light supply at tidewater.

The coal tonnage of the Pennsylvania Railroad for the week ending Oct. 21 was: Coal, 174,300; coke, 49,559; total, 223,859. The total tonnage this year to Oct. 21 was 8,846,880 tons.

The coal tonnage of the Chesapeake & Ohio Railroad for the nine months ending Sept. 30 were as follows:

	1882.	1881.	Increase.	P. c.
Coal	639,285	531,168	108,117	20.4
Coke	67,673	52,855	14,818	27.9
Total	706,958	584,023	132,935	21.1

The tonnage for September of this year was 89,557 tons, of which 16,257 tons went to Richmond and 15,304 to Newport News for shipment by water.

Passenger Rates to Kansas City.

The following supplementary circular is dated Oct. 25 and signed by the general passenger agents of the Chicago & Alton, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Hannibal & St. Joseph, the Illinois Central, the Kansas City, St. Joseph & Council Bluffs, the Missouri Pacific, the Vandalia Line and the Wabash, St. Louis & Pacific:

"Our joint circular of Oct. 19, 1882, *abolished* the following rates:

Between			
Chicago and St. Louis,	first class,	unlimited	$8.70
" "	"	limited	7.50
" "	second class,	"	7.75
St. Louis and Kansas City,	first class,	unlimited	8.50
" "	"	limited	7.50
Chicago and Kansas City,	"	"	12.60

"The following rates are the only ones now in effect:

Between			
Chicago and St. Louis,	first class,	unlimited	$8.00
St. Louis and Kansas City,	"	"	8.00
" "	second class,	limited	7.00
Chicago and Kansas City,	first class,	unlimited	14.80
" "	second class,	limited	13.00

"The second class limited St. Louis-Kansas City rate is to be used for basing purposes only."

Freight Rates from Iowa Points to Chicago.

A meeting of the representatives of the freight departments of the Iowa lines was held in Chicago, Oct. 26, to take some action regarding rates from points between Council Bluffs and the Mississippi River to Chicago. The following roads were represented at the meeting: Wabash; Rock Island; Milwaukee & St. Paul; Northwestern; Burlington, Cedar Rapids & Northern; Des Moines & Fort Dodge, and Illinois Central.

It was agreed to restore the rates from all points in Iowa between Council Bluffs and the Mississippi River to the figures prevailing before the war on Des Moines business broke out.

Passenger Rates to Texas.

At a meeting of the Southern Association of General Passenger and Ticket Agents in Memphis, Tenn., Oct. 25, a rate sheet to Texas points was agreed on, to take effect Nov. 1. The basis of the new tariff is a uniform rate of 3 cents per mile for first-class passengers and 2 cents per mile for immigrants.

Arkansas Fruit Shipments.

The St. Louis *Republican* says: "The St. Louis & San Francisco Railroad Company is now hauling about 25 car loads of apples per day over the line, the fruit coming from off the Arkansas Division, but more particularly from Rogers, in Benton County. In order to guard against waste, and to prevent the fruit from being bruised by so much handling the 'Frisco is using the freight cars of other lines for shipments beyond this city. The apples are being shipped not only to St. Louis, but to Chicago, St. Paul and Rochester. A great many Chicago, Burlington & Quincy cars are now being used in this traffic, and when a car for Chicago or St. Louis is loaded it goes through promptly, without breaking bulk or transfer.

"That portion of Arkansas now traversed by the 'Frisco Line is one of the finest fruit countries known. Apples especially thrive there and grow to great size and perfection. Before the people in the Boston Mountain region had railway facilities there was little or no remuneration to those raising fruit. Now a large apple orchard—and there are many in Benton and Washington counties—is as valuable to a farmer as an ordinary wheat field. There is no telling how many thousands of dollars will be saved to the farmers of that region since the advent of the iron horse, in the mere shipment of fruit alone.

"It is well to add that the Arkansas apples being shipped to Rochester are reshipped from there to Boston and New York city."

Southern Winter Excursion Tickets.

Mr. C. P. Atmore, General Passenger and Ticket Agent of the Louisville & Nashville Railroad, has just issued the following circular:

"A resolution was adopted by the Southern Association of General Passenger & Ticket Agents at the annual meeting held in Cincinnati, Oct. 5 and 6, that winter excursion tickets be good for passage thirty days from date of sale going and thirty days from date of departure returning. As many lines are well stocked with these tickets, but with limit of fifteen days in which to make the trip, I would respectfully suggest that it is not necessary to reprint these tickets to fulfill the new requirements, but that they be indorsed that they are good for thirty days going and returning. This line has so changed their issue of tickets by indorsing them as shown below: 'Good thirty days after date of sale going, and thirty days after date of departure returning.'"

California Through Passengers.

The number of passengers arriving in and leaving California by the Central and Southern Pacific roads for the nine months ending Sept. 30 was:

	1882.	1881.	Increase.	P. c.
Arrived	40,987	30,475	10,512	34.5
Departed	28,562	23,077	5,485	23.9

This shows an apparent gain to California of 12,425 this year, against 7,398 last year at this time.

THE SCRAP HEAP.

Locomotive Building.

The Hinkley Locomotive Co. in Boston has just completed two engines of 2 ft. gauge for the Bridgeton & Saco River road in Maine. They are of the Forney pattern, similar to those built some years ago for the Billinca & Bedford road, but with some improvements.

The Pennsylvania Railroad shops in Altoona are to build a number of new consolidation engines for the road.

The Baldwin Locomotive Works in Philadelphia are building 8 mogul freight engines for the Mobile & Ohio road.

Car Notes.

The car works of Milliken, Boyd & Co., at Youngstown, O., are running full time on several large orders.

The Gilbert Car Works in Buffalo, N. Y., have taken an order for 400 coal cars for the New York Central & Hudson River road. They are also building a number of cars for the Mexican Central road.

The Pennsylvania Company will, it is stated, soon begin the erection of new and extensive car shops at Ft. Wayne, Ind. These shops will be the chief car shops for all its lines.

The Washburn Car Wheel Co., in Hartford, Conn., is adding largely to its shops.

The Wilmington & Northern Railroad Co. is about to build car shops on land it has just bought on the Schuylkill River opposite Reading.

The Terre Haute Car Co., in Terre Haute, Ind., has taken an order for 100 flat cars for the Cincinnati, Hamilton & Dayton road.

Bridge Notes.

The Passaic Rolling Mill Co, in Paterson, N. J., has lately completed several iron bridges on the New York, West Shore & Buffalo road.

H. S. Hopkins & Co, in St. Louis are building a number of bridges for the Texas & St. Louis road, including the great bridge over the Arkansas River at Pine Bluff.

Iron and Manufacturing Notes.

The Western Fence Co., of Chicago, built the fencing for the entire line of the New York, Chicago & St. Louis road between Chicago and Fort Wayne in 60 days. This fence has been commended for its excellent appearance.

The Clayton Steam Pump Works in Brooklyn, N.Y., have already furnished three air compressors for the Hudson River Tunnel, and have just completed a fourth, to be placed on the New York side. This new air compressor is of the Clayton improved duplex pattern, having 22-in. diameter steam cylinders, two 24-in. diameter air cylinders and 30 in. stroke. It is 20 ft. in length, 10 ft. in width; weighs 25 tons; and its working capacity is 3,750,000 cubic feet of air per 24 hours.

Mr. Wm. R. Hart (late of Naylor & Co.) has become a partner in the firm of Bond, Parsons & Co., of New York, and his business is combined with that of the firm. Mr. Hart will continue his office at No. 224 South Third street, Philadelphia, under the firm name.

Contracts have been let for buildings and machinery for the new Anderson, Dupuy & Co. steel works at Chartiers Creek, near Pittsburgh.

The Montour Iron & Steel Works in Danville, Pa., recently made a lot of T-rails weighing only 12 lbs. to the yard. These rails are 2 in. high, the flange being 1¾ in. wide, and the head about ¾ in. These rails were rolled 48 ft. long and then cut in two.

The Cleveland City Forge & Iron Co. is now in their new location on Lake street, where they have new buildings 765 by 80 and 400 by 85 ft, fitted at present with 14 steam hammers and a complete outfit for doing railroad work. This gives them three times their former capacity, and additional buildings, including a new rolling mill, are contemplated next season.—*Cleveland Trade Review.*

The Columbia and Liberty furnaces of John Wissler & Sons, in Stony Creek Valley, Virginia, have been purchased recently by a company of New Jersey capitalists. The price paid was $250,000. The new owners are said to have in contemplation the erection of rolling and nail mills, and the building of a railroad from Edinburg, on the Valley Branch of the Baltimore & Ohio Railroad, to the works.

The new Victoria Furnace being built at Goshen by the Iron and Steel Works Association of Virginia, is expected to be ready to blow in in a few days.

The mill and water power of the James River Steel Manufacturing & Mining Company, near Lynchburg, Va., are advertised to be sold on Dec. 14 next. The works are complete in their construction and are advantageously located.

The Rail Market

Steel Rails.—The market is quiet and prices substantially the same, quotations being $45 to $46 per ton at mill. The mills are pretty well filled up with orders for the winter.

Rail Fastenings.—Spikes are in steady demand at $3 per 100 lbs; fish-plates, $2.50 to $2.60; track-bolts, $3.75 to $4.15, according to pattern.

Old Rails.—Old iron rails are quoted at $28 to $28.50 per ton in Philadelphia for American tees, $27 to $27.50 for foreign, and $29.50 for double-heads. A small lot of old steel rails is reported sold at $23 per ton.

Train Brakes in Holland.

The Dutch government has lately issued a decree which will take effect in May next, the purport of which is as follows:

"That article 84 of the General Regulations for Railways is thereby superseded by the following order:

"For express trains running at a greater speed than 60 kilometres per hour (37½ English miles) the engines, tenders, carriages and vans must be provided with automatic continuous brakes, of a system prescribed or approved of by the Minister of Public Works.

"Similarly, automatic brakes of such prescribed or approved system will have to be fitted to the engines, tenders, carriages and vans of such passenger trains which do not run at a higher speed than 60 kilometres (equal 37½ miles) per hour, as the Minister of Public Works may order."

The North Adams Collision.

The Massachusetts Railroad Commissioners have investigated and reported on the recent collision in the freight-yard at North Adams, by which six workmen were killed and a number of others injured. After detailing the circumstances of the collision, the Commissioners say:

"The Board is of opinion that the weight of testimony shows that Mr. Watson, the engineman of the Sanford, was proceeding in an improper and dangerous manner; first, because he did not go to the west-bound track by the crossover, and secondly, because not doing so, he did not protect himself by a flagman from any approaching train. And, if this view of the case were doubtful, it is certain that to proceed as he did in fog so dense that vision could only extend two car-lengths in advance, was an act of gross negligence. A slight measure of precaution would have prevented this fearful disaster, and the man who blindly moved westward upon an east-bound track in the yard of a road operated by four railroad companies, where, by his own statement, he had no explicit promise of protection, must be held guilty of criminal negligence. So far as the management of the road is concerned, the Board regrets to say that a loose system has prevailed; that trains have too often been permitted to run in the wrong direction without proper precaution, and that this has been so often that it ought to have been known and prevented. Difficulty and danger naturally accompany the operations of a railroad yard by different corporations. But this makes the enforcement of strict discipline and regulations a duty. And the power to enforce such regulations was given by special legislation. Chap. 230 of the acts of 1881 gives the Manager power to make and enforce all needful rules for operating the road, including the yard. This was intended to remove all doubt. And further, and more important, he was authorized to operate the yard himself, including the shifting of cars therein, and to hire men and power and to use the locomotives of the operating roads if necessary. It is doubtful whether the yard can be oper-

ated with safety without recourse to this authority. Even if any additional expense is incurred, it is hardly necessary to say that security is to be preferred to economy, and that security is true economy. Section 3 of the act referred to protects the state from any additional liability to be incurred by reason of rules intended to promote safety in operating the road. But, if that section had never been enacted, it would be no less a duty to take every precaution which tends to protect the lives and limbs of travelers or employés. A road which cannot be operated with reasonable safety ought not to be operated at all. And no exception should be made in favor of a road owned by the commonwealth. Whether or not it is wise for the state to engage in a railroad enterprise, it is certain that its road should be as safe as any road can be.

"The Commissioners have regretted, and have often expressed this regret, that the provisions of chapter 230 have, with the exception of those relating to the delivery of freight and the reports of earnings, remained a dead letter, and attention is once more called to the need of having one head controlling all the operations of the yard. The manner of making up the construction train was dangerous, and would be condemned without hesitation by all railroad men, if it had been intended for the whole run. No stronger illustration of its dangerous character can be given than the results of this collision. Had the locomotives struck each other, the injury would have been slight; and it is probable that no suffering or death would have occurred. It is probable, also, that no collision would have occurred, because a proper look-out would have been kept on the Deerfield. The method of making up the train was the usual one. Perhaps it might be sustained by the practice in like cases elsewhere.

"The Board, in conclusion, repeats its recommendation that a system of rules for operating the yard be adopted by which the management shall govern the working of all the roads there, and that, on the main tracks, at least, all the switches shall be operated by employés of the state manager. The manner of apportioning the expense between the roads is a matter of detail which will not be difficult. The system is vital to the regular and safe operation of the yard."

Burning of a Pullman Car in England.

A dispatch from London, Oct. 30, says: "A Pullman sleeping car attached to an express train which left St. Pancras station, London, for Glasgow, caught fire from the stove. One passenger was burned to death. Three passengers escaped with great difficulty. The accident is a novel one in England, and creates much sensation."

A Big Derrick Car.

The Pardee Car & Machine Works at Watsontown, Pa., have just turned out for the New York, West Shore & Buffalo Railway a derrick, or what is more commonly known as a wreck car, that is considered by railroad men to be the strongest and most complete car of the kind ever seen in this section. It is 35 ft. long by 8 ft. in width, the frame being composed of heavy wrought channel iron, 10 in. wide, and strongly braced with diagonal braces of the same material. The improvement over other derricks consists, in part, of two 10-ton jacks, one on each side of the car, which are used in lifting the body of the car so as to relieve the trucks of all strain when in operation. There are also four sets of grips or pincers, connected by heavy chains with the platform, and so arranged that they can be attached to the rail and drawn tightly by means of screws on the platform, thus holding the car firmly in place while at work. The upright column, which is of cast iron, covered with boiler iron, weighs over 3,000 pounds. The entire weight of car and derrick is between 15 and 16 tons.

Lucid.

This is the way the engineer explained the Lawrence engine governor: "When the fat side of the big eccentric is opposite the fat side of the little eccentric, she slows up; but when the two fat sides pull together, she pegs away at full stroke."—*The Tech.*

Possible Compensatory Damages.

There having been a false report that Jay Gould came near being run over by a locomotive at Rochester, the New York *Evening Post* indulges in the following speculations as to what it might cost a railroad company to disable a man who makes millions yearly:

"It is gratifying to learn that there is no truth in the story of Jay Gould's narrow escape from being run over by one of William H. Vanderbilt's engines at Rochester. As Gould no longer controls the Erie Railroad, there was no rational ground for Vanderbilt's desire to run him down or kill him, and had it been committed the act would have to be attributed to pure and almost insane malice. It is interesting, however, to speculate upon what might have been the consequence had the fiendish deed been really perpetrated. Had Jay Gould been killed, his family could only have recovered $5,000; had he been injured, however, to such an extent as to prevent his continuing his labors in Wall street, he could have recovered damages based on his earning capacity. In the last twenty years he has earned $60,000,000, or $3,000,000 a year; and a verdict based on this rate for the rest of his life would net him, perhaps, some $20,000,000 to $30,000,000 more. This would sweep away a large part of Vanderbilt's earnings, and therefore ordinary prudence would obviously dictate a careful management of the latter's engines when Gould is about. It would only be in the crisis of a great railroad war between trunk lines that such means would be resorted to, and then only in sheer desperation. Gould, in his interview on the subject, says, in his good-natured way: 'If I ever go into the business of supplying the public with news, as I have been informed by sundry newspapers that I intend to do, I hope I shall be a little more careful as to the news I supply than some people now occupied in that way seem to be.' No good journalist can be too careful on this point, and we are glad that Gould's attention has been called to the shocking recklessness and inaccuracy so often apparent in the profession. He will, we fear, find the task of thoroughgoing reform a hard one, and he cannot, even with his immense resources, begin a day too soon."

Young Men's Christian Association, Railroad Branch.

The Kansas City Association reports for the year ending Aug. 31 a total of 92 members. During the year there were 31,141 visitors to the reading-rooms, 2,945 to the bath-rooms, 9,110 attendants at the various religious meetings, and a large attendance at the lectures, receptions, etc. A large number of visits were made by members to the sick and injured. The total disbursements during the year were $2,836.

English Locomotives for South America.

Locomotive builders in Manchester have plenty of work in hand for export, and we may add a few particulars with reference to a number of specially-designed engines for steep gradients and sharp curves, which Messrs. Nasmyth, Wilson & Co., Limited, of Patricroft, near Manchester, are constructing for two of the South American railway companies. One order is for the La Guayra & Carracas Railway Company, and the engines are constructed to travel on gradients averaging about 1 in 26, with curves in some places of 140 ft. radius. The engines have only a 3-ft. gauge, but are fitted with cylinders of 14½-in. diameter and 22-in. stroke, and supplied with Joy's patent valve motion. To enable the engines to pass round sharp curves a special arrangement is introduced. The engines are carried on six-coupled wheels, with a four-wheel bogie, and the six-coupled wheels are kept as close together as possible under the barrel of the boiler, the rigid wheel base being only 6 ft. 5 in., whilst the bogie has a lateral play of 3 in. or so each way, in addition to the swiveling movement. The locomotives are tank engines, carrying their own water and fuel, weighing altogether 33 tons when in working order, and are constructed to take a load of 80 tons up continuous gradients of 25 miles. Passenger engines of similar construction but of heavier weight, having 16-in. cylinders and 24-in. stroke, with four-coupled wheels and four-wheeled bogie in front, are being constructed for the San Paulo Railway, South America, and the firm have also in hand an order for the Bengal Central Railway.—*London Engineer.*

Testing Lubricating Oils.

A good test for oil is to place single drops in line upon a piece of plate-glass about 8 in. wide and 24 in. to 30 in. long, one end being raised about 6 in. to 8 in. to form an inclined plane. The drops of oil start from the top of this inclined plane upon a race with each other. The first day sperm oil will be found in the rear, but after a while it will catch up and overtake the rest, and will even be found in motion after the other oils have dried up. An oil having a light body runs quickly and dries quickly, but an oil that has a body and free flow will readily be detected by this test. An oil may have a good body and yet have a tendency to gum badly, which quality will also be easily detected upon the glass. The oils should be covered from the dust while these tests are being made. A good test for the presence of acids is to put small quantities of oil in copper dishes which are easily made by depressing bits of sheet-copper with a round-face hammer. If acid is present it will attack the copper and extract the verdigris.—*English Mechanic.*

Damages.

The counsel for the railroad company has been settling with the widows of two guards who had been killed in the company's service.

"O, sir," says one widow, "it seems to me that you could allow me more than that!"

"We cannot, madame. Your husband was a guard like the other, and he came to his death under similar circumstances—they were both run over and killed instantly."

"I know, but he was killed by the lightning express and the other man was run over by a way freight!"—*Alleged French Wit.*

Fathers often make a great mistake in bringing up their sons to follow their own trade. A Philadelphia trunk-maker was wiser. He had 10 sons, and all are now baggagemen on railroad passenger trains. That trunk-maker is getting rich.—*Baltimore Day.*

OLD AND NEW ROADS.

Alabama, New Orleans, Texas & Pacific Junction.—This English company, which controls the Alabama Great Southern, the Vicksburg & Meridian, the Vicksburg, Shreveport & Pacific and the Cincinnati, New Orleans & Texas Pacific companies, advertises in London an issue of $3,500,000 (£700,000) new 6 per cent. debentures, having 25 years to run, and secured by deposit with trustees of the securities of its controlled lines. The issue price of the debentures is 94. The proceeds of these bonds are to be used for the completion of the lines from Meridian to New Orleans and from Monroe to Shreveport.

Baltimore & Ohio.—The City Council of Wilmington, Del., has passed the ordinance giving this company the right of way through the city for its new line from Baltimore to Philadelphia.

Bangor & Portland.—The completion of tracklaying on the extension of this road from Pen-Argyl, Pa., to Nazareth was recently noted. Regular trains are now running between Portland and Nazareth, 25 miles.

Binghamton & Williamsport.—This company has been organized and the capital stock fixed at $3,000,000. Surveys for the line will be made at once. It is to run from Williamsport, Pa., to Binghamton, N. Y., about 100 miles.

Boston, Winthrop & Point Shirley.—At the annual meeting in Boston, Oct. 31, the Treasurer reported that the gross earnings for the year ending Sept. 30 were $9,219; net, $3,175. The bonded debt was $18,000; floating debt, $25,091. The business of the road had shown great improvement.

The stockholders voted to authorize an increase of stock from $19,450 to $50,000; also to issue bonds to an amount not to exceed $50,000, including the present bonds.

Boston, Hoosac Tunnel & Western.—A report comes from Boston that negotiations are in progress for a sale of this road to Wm. H. Vanderbilt. Such a purchase would give the New York Central a line to Saratoga, and also control of both the Western connections of the Hoosac Tunnel Line. The report lacks confirmation at present.

Bridgeton & Saco River.—The grading of this road is about completed, and tracklaying is in progress. The road will extend from Hiram, Me., on the Portland & Ogdensburg road, to Bridgeton, 16 miles. It is of 2 ft. gauge, and has been built under the supervision of Mr. George E. Mansfield, who built the Billerica & Bedford and the Sandy River roads of that gauge.

Canadian Pacific.—A dispatch from Montreal, Oct. 27, says: "The Canadian Pacific directors and a committee of the Montreal corporation have come to an arrangement today for the erection by the former of a monster depot, costing $2,000,000, in the east end of the city. The Council will contribute $200,000 cash, in addition to 225,000 square feet of valuable city property, as a subsidy. Citizens do not like the idea of contributing so much, but the company has a majority in its favor in the corporation."

Central, of Georgia.—This company has put on a new fast train to run through between Atlanta and Savannah, making very few stops. The average speed is about 35 miles an hour. To run this new train three new engines have been built, having 16 by 24 in. cylinders and 5 ft. 10 in. drivers, and three entirely new trains, each consisting of a mail car, a combination baggage and smoking car, two first-class passenger cars, one for white and one for colored people, a sleeping car and a dining car. Most of the cars were built in the Savannah shops.

Charleston & Savannah.—The new iron bridge over the Savannah River is completed, and trains began to cross it last week. It has cost about $100,000.

Chicago & Alton.—A suit has been in progress some time in which the Massachusetts Mutual Life Insurance Company seeks to set aside the foreclosure and sale by which the Chicago & Illinois River road passed into the possession of this company. It is now reported that negotiations are in progress for a settlement of this suit by compromise.

Chicago & Eastern Illinois.—The decision of the United States Supreme Court, as telegraphed from Washington, is as follows:

"The Chicago, Danville & Vincennes Railroad Company *et al.*, appellants, *vs.* William R. Fosdyck *et al.* Appeal from the Circuit Court of the United States for the Northern District of Illinois. This case was argued and decided at the last term of the Court, but on account of an imperfection in the record the decision was set aside and a petition for a rehearing granted. The case having been reargued, the Court now orders that the appeal from the decrees of April 12, 1877, and of April 16, 1877, respectively, be dismissed, upon the ground that those decrees were vacated by the reversal of the prior decree of foreclosure and sale, rendered Dec. 5, 1876, and the decree entered Nov. 19, 1877, in favor of Frederick W. Huidekoper, Thomas W. Shannon and John M. Denison, trustees, be reversed, and that the cause be remanded, with directions to proceed thereon as may be just and equitable. Opinion by Justice Matthews."

Mr. Edwin Walker, the attorney of the bondholders of the Chicago, Danville & Vincennes, stated to a Chicago *Tribune* reporter that this last decision of the Supreme Court vacates the orders of the Circuit Court confirming the Master's report of the sale under the original decree and the orders directing the Master to execute and deliver the purchasers a deed of the property. This leaves the foreclosure proceedings precisely as the case stood at the first reference to the Master before the decree. Mr. Walker also gave his opinion of what the future course of proceedings would be, as follows: "The case will be referred to ascertain the amount now due on the first mortgage bonds. Upon this reference the Master will probably be required to ascertain and report the net earnings of the road from the time the purchasers were given possession, April, 1877. These purchasers, now represented by the Chicago & Eastern Illinois, claim to be the owners of 2,320 of the 2,500 bonds, and their claim will be reduced by the net earnings. The holders of the remaining 170 bonds, who did not join the syndicate of the bondholders for the purchase of the property, claim payment of the bonds in full. When the amount found due the bondholders is ascertained, the old company, upon payment, will be entitled to the possession of the road. By the reversal of the decree and orders, the legal title of the Chicago, Danville & Vincennes Company is maintained. The Supreme Court also rendered a deficiency decree in favor of the purchasing bondholders for about $1,800,000."

Chicago, Indiana & Ohio River.—This company has filed articles of incorporation for a railroad from Hammond on the Chicago & Western Indiana road, by Kentland, Benton & Warren to Terre Haute, Ind. The distance is about 146 miles.

Chicago, Rock Island & Pacific.—Additional second track has been brought into use from Bremen, Ill., to Mokena, six miles.

Connotton Valley.—At a meeting of the directors, held Oct. 24, the following circular was adopted and ordered to be sent to the bondholders:

"The directors of this company, having given the matter careful consideration, have decided that the funds now in their hands cannot be used for the payment of the coupons upon the bonds of the company due Nov. 1, 1882, which funds are only applicable, by the terms of the subscription under which they were received, to the completion of the road as therein set forth. In the unfinished state of the road, which it is hoped will be of short duration, the net earnings, although under the circumstances as large as could be expected, have been inadequate to meet the interest. Within a short time the directors propose to present plans to the security-holders for procuring additional equipment, rendered necessary by the increasing business of the road, perfecting the construction of its lines so as to enable it to increase and accommodate that business, and establishing a connection with Zanesville, which is known to be of great importance to the company."

Galveston, Harrisburg & San Antonio.—The San Antonio *Express* says of the work on the El Paso Extension of this road: "There are now but two parties of engineers in the field, those of Gresham and Hinman, who are now engaged in superintending tunnel No. 2 and the heavy rock work under Johnson and Monroe. The ends of the approaching tracks are now 15 miles apart and the Southern Pacific forces are laying track at an average of about three-quarters of a mile a day. The track is now at the Pecos on the east end and construction of the track is delayed by the work on the Pecos bridge. The false work will be completed so that trains can cross in about three weeks. This false work is some 300 ft. in length. The main bridge across the Pecos will not be completed for some time. The piers, four in number, are finished. They are 70 ft. high and are built of rock from the immediate vicinity. The Sunset Company will build until they meet the approaching forces of the Southern Pacific. Capt. G. W. Polk, Chief Assistant Engineer, is now at River Bend camp and is pushing the work vigorously, as he does everything that is entrusted to him. During the delay at the Pecos Capt. Monroe's tracklaying forces are not idle, but are surfacing the track between Seminole and the Pecos. Maj. J. W. Goodwin, Engineer in charge of bridges and tracklaying, is now at the far end and leader of forces, and will push his work as rapidly as circumstances will allow. The road is now completed west of San Antonio 222 miles, and the Southern Pacific is completed from El Paso east 245 miles. The ends of the track will not meet before Dec. 1. The grading will be finished by Nov. 1, and the delay will be caused by heavy bridging between the Pecos and River Bend. There are now about 350 men engaged on the east end and they are working night and day. On the west or Southern Pacific end the force is amply sufficient to lay a mile of track a day. The Engineer in charge is Mr. W. D. Gillette, the Superintendent of Construction, Mr. Strowbridge, having moved his forces, 3,000 Chinamen, back to the Mohave desert, in Arizona, where they are at work on a branch to tap the Atlantic & Pacific on the Colorado."

Georgetown & Lanes.—The contract for building this road has been let to A. J. Twiggs, of Augusta, Ga., the work to be completed in one year. Mr. Twiggs will receive $25,000 voted by the town of Georgetown, and the balance in first-mortgage bonds of the company. The road is to run from Georgetown, S. C., to Lanes on the Northeastern road, 38 miles.

Genesee Valley.—A mixed train has been put on this road to run over its whole length from Rochester, N. Y., to Hinsdale, and regular passenger trains will begin to run in a short time.

Arrangements have been made by which the New York, Lackawanna & Western trains will use the track of this road between Mt. Morris and Rochester, the contract to take effect at once.

Indiana, Illinois & Iowa.—Work on the grading of this road is in progress from Momence, Ill., eastward, and

from North Judson, Ind., westward, and the contractors expect to have the whole line, about 47 miles, done by Jan. 1. Track has been laid from Momence east five miles.

Jacksonville, St. Augustine & Halifax.—The clearing and grading of this road is now nearly completed to St. Augustine, and the track is laid from the terminus on the St. Johns River opposite Jacksonville, Fla., south by east five miles. A large wharf has been built at the terminus, and a ferry boat purchased by the company.

Lackawanna & Pittsburgh.—This company has been organized to build a railroad from Rockville, N. Y., on the Genesee Valley road, to Perkinsville, on the New York, Lackawanna & Western, a distance of 42 miles, with a branch 16 miles long to Hornellsville and Canisteo.

Marietta & Cincinnati.—The report of the Special Master to the Court last week in relation to the amount of the debt and the portion of it deposited in accordance with the plan of reorganization, was substantially as follows:

Whole amount of mortgage bonds at this time outstanding including unpaid past due interest:

1. First mortgage bonds, $4,725,000, of which amount there is now on deposit with the Farmers' Loan & Trust Company, in New York, under the agreement of reorganization of Jan. 31, 1882, including coupons for unpaid interest, $4,565,295.

2. Second mortgage bonds issued, etc., $3,375,000, of which amount there is on deposit with said trust company, $3,357,450.

3. Third mortgage bonds issued, etc., $4,320,000; on deposit, $4,223,520.

4. Fourth mortgage bonds issued, etc., $6,480,000; on deposit, $6,480,000.

5. Fifth mortgage bonds, $3,665.44; on deposit, $496.71.

6. Whole amount of other claims, and evidence of indebtedness now outstanding against said railroad company is, as near as can be ascertained, $7,429,772.23, of which amount there is now on deposit with said trust company, exclusive of interest, $6,195,892.25.

7. Whole amount of detached coupons of the first mortgage bonds of said railroad company now on deposit (included in first finding above), $5,687.50.

8. Whole amount of detached coupons of second mortgage bonds on deposit, $18,165.

9. Detached coupons of third mortgage bonds on deposit, $750,000.

10. Whole amount of first preferred capital stock certificates issued by said railroad company is 162,351 shares at $50 each, amounting to $8,117,550. Scrip of same class issued to the amount of $13,119.44. Now on deposit 152,225 shares, to amount of $7,611,250. No scrip deposited.

11. Second preferred capital stock certificates issued in 89,009 shares, amounting to $4,450,450. Scrip of same class issued to the amount of $9,968.23, of which amount of certificates there is on deposit 75,808 shares, amounting to $3,790,400. No scrip on deposit.

12. Whole amount of common capital stock certificates is 27,771 shares, amounting to $1,388,550. Scrip of same class issued, $20,362.33. On deposit, 13,441 shares, amounting to $672,050. No scrip deposited.

13. Whole amount of capital stock certificates of the Cincinnati & Baltimore Railroad Company is 24,949 shares, amounting to $1,247,450. There are 24,515 shares now on deposit, amounting to $1,225,750.

14. The whole amount of capital stock of certificates of the Baltimore Short Line Company is 24,889 shares, amounting to $1,244,450, of which amount there is on deposit 24,861 shares, amounting to $1,243,050.

15. There is on deposit detached past due coupons of the mortgage bonds of the Baltimore Short Line, amounting to $131,250.

16. All said bonds, coupons, scrip, stock claims and evidence of indebtedness that are described in the schedule attached to the affidavit of the President of said Trust Company have been duly transferred by the holders or owners thereof to the Committee of Reorganization.

17. Each and all securities mentioned have been deposited with said Trust Company.

Said agreement contains the signatures of 1,099 persons, firms and cerporations, which have been deposited with said Trust Company for the use of said Reorganization Committee, and are on deposit.

Mexican National.—The Toluca Division of this road, from the city of Mexico to Toluca, was open in September 27 days and carried an average of 655 passengers a day. The road is not yet open for freight.

The Northern Division and the Texas-Mexican road, togegether extending from Corpus Christi, Tex., to Monterey, Mexico, 333 miles, earned $17,300 in the first week after the completion of the road to Monterey.

The bridge over the Rio Grande at Laredo, recently carried away by a flood, is now entirely rebuilt.

Mutual Union Telegraph.—A plan has been completed to put 51,000 shares of the stock of this company in the hands of three trustees. The trustees are George William Ballou, of George William Ballou & Co., A. P. Potter, of the Maverick National Bank, of Boston, and George F. Baker. The stock consists of 100,000 shares. The trustees will pay the holders 5 cents a share and issue certificates in place of the stock. The stock will be deposited with the Central Trust Company, and the certificates will be listed on the Stock Exchange. The certificates will be negotiable, but the voting power will be left in the hands of the trustees. It is said that more than a majority of the stock has already been deposited under the provisions of this trust.

On application of Jay Gould and the Western Union Telegraph Company, Judge Van Brunt, of the New York Supreme Court, has issued an injunction restraining the placing of the stock in trust. The order was served on the Central Trust Company and others. The plaintiffs claim that as holder of Mutual Union stock, bought under an agreement to work the two companies in harmony, the proposed scheme jeopardizes their rights.

Natchez, Jackson & Columbus.—The Hinds County stock in this company has been sold to parties in the interest of the Georgia Pacific Company, and offers have been made for other stock. It is stated that if the Georgia Pacific can obtain control, the road will be changed from 3 ft. 6 in. to 5 ft. gauge, and extended from Jackson, Miss., to Columbus, about 140 miles.

New York Central & Hudson River.—Following their indictments against W. C. B. Rawson and George E. Rood, in connection with the recent tunnel disaster, the Grand Jury last week submitted the following presentment:

"We believe the best safeguard against similar disasters is to allow but one train in each outward and inward tunnel track between Fifty-sixth and Ninety-sixth street, and permit no train to enter tunnel until a return telegram is received that the preceding one has passed through the tunnel. By this plan we believe all risk from collision in the tunnel will be reduced to a minimum. The signal-train man at each end of the tunnel to be thoroughly competent, of good character, sober and intelligent, and not under 21 years of age.

"We recommend, as a further precaution, that the block system of signals be placed on all the tracks passing through the three tunnels.

"We find that the rear car of the New Haven train was one of very old construction, having but two longitudinal timbers, one on each side, and connected only by cross pieces in the form of a ladder; whereas cars of a later construction have from four to six longitudinal timbers, thus offering greater resistance. When the engine of the Harlem train struck this old car there was not sufficient longitudinal timbers to resist the blow, and it broke the cross pieces like so many reeds.

"We claim for the public that this old construction should not be used for passenger traffic. And the Grand Jury also recommended that the three tunnels be well and thoroughly lighted with electric lights, and that more ventilation be provided, in order to clear the tunnel more rapidly of smoke, steam and cinders.

"We urgently recommend the Legislature to take up the subject and enact such laws as will speedily bring about the changes here recommended."

New York, Chicago & St. Louis.—A controlling interest in this new road—the "Nickel Plate"—has been sold by the syndicate which built it to persons who are represented by Messrs. J. H. Devereux and Stevenson Burke, of Cleveland. The price paid is 37 for the preferred stock and 17 for the common stock.

Just who the purchasers are has not been announced, and rumor has named variously the Lehigh Valley, the Columbus, Hocking Valley & Toledo, the Cleveland, Columbus, Cincinnati & Indianapolis, and other possible and impossible parties. There appears to be little doubt, however, that Wm. H. Vanderbilt will finally appear as the real owner, and that the stories which have been circulated and telegraphed from all points of the compass are simply intended to cover up the real facts.

The company has $50,000,000 stock in all, $22,000,000 being preferred and $28,000,000 common stock. It has $15,000,000 first-mortgage bonds, a car trust debt of $4,000,000, which is payable one-tenth yearly, and a floating debt said to be between $3,500,000 and $4,000,000. The purchasers of the stock do not appear to have assumed any special liability, simply acquiring an interest in the stock, which is subject, of course, to the funded and floating debt.

The parties who built the road, at any rate, have made a good thing of it. In the formation of the original syndicate the members received for each $13,333 put in $10,000 in bonds, $20,000 in preferred and $20,000 in common stock. At the price paid they receive $10,800 for their stock and still retain their bonds. At this rate the building and selling of competing roads is a much more profitable operation than running them is likely to be.

In consequence of this sale, the New York, Lake Erie & Western Company has refused to give the new road the use of its terminal facilities in Buffalo any longer, and some new arrangements will have to be made.

New York, Lake Erie & Western.—This company has begun the sale of 1,000-mile tickets at $20 each, or 2 cents per mile. These tickets will be good over any part of the company's lines and can be used by different members of a firm or family, provided that only one person at a time can travel on the ticket.

New York, New Haven & Hartford.—A dispatch from Hartford, Oct. 25, says: "The directors have prepared extensive surveys and plans for a thorough reconstruction of the road, including plans for straightening the line, removing grades, stone-ballasting the road bed and probably the addition of more tracks upon the division between New York and New Haven. The company has heretofore declared its policy to be to expend all the earnings above the customary 10 per cent. dividend upon improvements, but they are satisfied that to maintain the high rate of speed demanded by the public the tracks of the New York Division must be radically altered. At a meeting of directors held yesterday, it was decided to go forward and make complete improvments to put the road in the absolutely best and safest condition possible, and for that purpose to borrow upon the property all the necessary money. The plans contemplate an outlay of many millions of dollars. Meantime the rolling stock is being brought up to the highest standard. The executive officers have been requested to immediately report plans for adoancing the improvements."

New York, Susquehanna & Western.—The new extension from Two Bridges, N. J., to Stroudsburg and Gravel Place, Pa., was formally opened Oct. 26 by an excursion, a large number of guests being carried over the road. The company will soon begin running coal trains, a supply of coal being assured from the mines which the company controls near Scranton. The coal trains will not run over the Pennsylvania Railroad into Jersey City, as the passenger and freight trains of the road do, but will be transferred to the Delaware, Lackawanna & Western at West End, N. J., and run over the tracks of that road to Hoboken. The Delaware, Lackawanna & Western will also haul the coal from Scranton to Gravel Place. To accommodate this business the company has ordered 500 new 20-ton coal cars.

Norfolk & Western.—This company's statement for September and the nine months ending Sept. 30 is as follows:

	September.	Nine months.
Earnings	$232,774	$1,671,429
Expenses	112,606	946,438
Net earnings	$120,168	$724,991
Per cent. of expenses	48.4	56.8

The expenses include the estimated proportion of yearly taxes. For the nine months there was an increase of $85,364, or 5.4 per cent., in earnings; an increase of $100,512, or 11.9 per cent., in expenses, and a decrease of $15,148, or 1.9 per cent., in net earnings.

Work on the New River Division is progressing steadily, and the road is approaching completion.

Northern Pacific.—Track on the Fergus Falls Branch is now laid to Breckenridge, Minn., 27 miles westward from the late terminus at Fergus Falls, and 78 miles from the junction with the main line at Wadena.

Track on the main line is now laid to Merrill, Montana, 23 miles westward from the late terminus at Park City, and 963 miles from St. Paul. Work on this end of the line is advancing steadily.

Pennsylvania.—This company's statement for September shows for that month, as compared with September, 1881, on all lines east of Pittsburgh and Erie:

An increase of gross earnings of	$682,596
An increase in expenses of	411,347
Net increase	$271,249

For the nine months ending Sept. 30, as compared with the corresponding period last year, the same lines show:

An increase in gross earnings of	$3,009,540
An increase in expenses of	2,800,844
Net increase	$208,696

All lines west of Pittsburgh and Erie for the nine months of 1882 show a surplus over all liabilities of $943,281, being a decrease of $1,325,502, as compared with the corresponding period of last year.

In Philadelphia, Nov. 1, the Finance Committee met to consider the semi-annual dividend rate, and, after remaining in session an hour, made a report to the board of directors. The board remained in session two hours and adopted the following:

"*Resolved*, That the President and board of directors do hereby declare a semi-annual dividend of 4½ per cent. upon the capital stock of the company out of the profits, and payable, clear of state taxes, on and after Nov. 29, 1882, to the shareholders as they stood registered on the books of the company at 3 o'clock p. m. Oct. 31, 1882, or to their legal representatives, of which amount 2½ per cent. shall be paid in cash and 2 per cent. in scrip redeemable in cash upon its delivery or convertible into the capital stock of the company if presented in sums of $50 previous to Feb. 1, 1883."

Pennsylvania, Slatington & New England.—The bridge over the Delaware River at Portland, Pa., is nearly completed. The bridge is 650 ft. long; there are five piers, which are 46 ft. high above low-water mark. The bridge trusses are 22 ft. deep (it is a deck bridge), making the roadway 68 ft. above low water.

A mortgage for $1,200,000 has lately been executed and recorded, the Metropolitan Trust Company, of New York, being trustee. The road will extend from Slatington, Pa., across New Jersey to Pine Island, N. Y., 74 miles.

Pittsburgh Southern.—This road, lately bought by the Baltimore & Ohio Company, is to be changed from 3 ft. to standard gauge and almost entirely rebuilt. It will be connected with the Wheeling, Pittsburgh & Baltimore Branch at Washington, Pa., thus completing the through line from Wheeling to Pittsburgh. A branch is also to be built from Finleyville east to the Monongahela River and thence into the coke region.

Skowhegan & Athens.—The location of this road has been completed from Skowhegan, Me., to Athens, 12½ miles. The line is not a difficult one, and will have only three small bridges. The earth-work will average about 5,000 cubic yards to the mile. The steepest grade will be a short one in Skowhegan village, of 95 ft. to the mile. The road is to be of 2 ft. gauge. Proposals for building the road will be received until Nov. 10. Bids will be received for clearing, grading and bridging and for tracklaying, the company to furnish material, or for the whole work, including the materials, plans and specifications can be seen on application to A. S. C. Hall, President, at East Madison, Me., or Frederick Danforth, Engineer, at Gardiner, Maine.

South & North Alabama.—An information was recently filed in the court at Montgomery, Ala., to forfeit the charter of this road. The alleged grounds are that 10 years ago the company issued and delivered preferred stock at 40 cents on the dollar to the Louisville & Nashville Railroad Company, and second, that the former company allowed its road to be run and its business to be conducted by the Louisville & Nashville Railroad Company. The Court sustained a demurrer to the information, holding that the issue of stock was merely a matter of private concern to the stockholders, not a wrong to the state, and so long as the road was run between the points named in the charter the object of the state in granting the charter was accomplished, and there was no authority to forfeit the charter.

Syracuse, Chenango & New York.—In the suit of the Syracuse Savings Bank and others, the New York Supreme Court has granted an order directing Receiver Belden to sell the road as soon as the necessary public notice of sale can be given. All stays of proceedings heretofore given are vacated.

Tennessee Coal, Iron & Railroad Co.—It is reported that the Nashville, Chattanooga & St. Louis Company is negotiating for the purchase of this company's railroad, running from Tracy City, Tenn., to the company's coal mines. If the purchase is completed the road will be extended down the mountain to a point near Chattanooga, completing a second or loop line around the Cumberland mountain. The negotiatiations are for the sale of the road only, the Tennessee Company to retain its coal and iron property.

Texas & St. Louis.—Work is progressing well on this road and the company expects to have the track all laid by Nov. 20 between Bird's Point (Cairo) and Clarendon, Ark., 215 miles, and between Pine Bluff and Texarkana, leaving only the gap between Clarendon and Pine Bluff to be filled. When the gap southwest of Pine Bluff is filled there will be an unbroken line of 450 miles from the Arkansas River to Gatesville, Tex.

Union Pacific.—On the Oregon Short Line track is now laid from Granger, Wy., to the junction with the Utah & Northern at Portneuf, Idaho, 204 miles. From Portneuf to Pocatello, 10½ miles, the Utah & Northern track is used, and from Pocatello westward the track is now laid for 44 miles, to a point 16 miles beyond American Falls. From the present end of the track to the proposed terminus at Baker City, the distance is 328 miles.

Wabash, St. Louis & Pacific.—The Chicago *Tribune* of Oct. 31 says: "It is reported that during the recent visit of Jay Gould and Vice-President Hopkins of the Wabash to the West, it has been agreed to remove the general headquarters of the Wabash Railway to Chicago. The offices to be transferred here are those of Vice-President and General Traffic Manager J. C. Gault, General Freight Agent A. C. Bird, and General Passenger and Ticket Agent H. C. Townsend. The office of General Superintendent Andrews and the operating department are to remain in St. Louis. It is believed that this move will greatly benefit the Wabash, as Chicago is now the great business point of that road, and its business affairs can be much better directed from this point than any other on its line. The officials of the Wabash, including Vice-President Hopkins, who is virtually a Chicago man, have long been in favor of moving the headquarters of their road to Chicago, being convinced that such a move would greatly aid them in developing the resources of the road. The change would have been made some time ago but for the refusal of Jay Gould to give his consent, as he felt rather partial toward St. Louis. But his recent trip of inspection has convinced him that Chicago is the point for the headquarters of the road and that its affairs could only be benefited by the change, and therefore he gave his consent. It is understood that the general officers above mentioned will move their headquarters to this city as soon as suitable offices have been secured, and parties are now at work looking up a good and convenient location."

Western Maryland.—At the special election last week the people of Baltimore voted by a large majority in favor of granting this company an additional loan of $684,000, for the purpose of laying steel rails, putting up iron bridges, and providing terminal facilities for increased business.

Wisconsin Central.—Regular trains have begun to run between Neenah, Wis., and Oshkosh, on the new Milwaukee Extension. The work on the extension is advancing steadily.